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ABSTRACT

This first volume of a 2-volume curriculum guide contains 16 problem areas selected as suggested areas of study to be included in a core curriculum for 10th-grade or second-year students enrolled in a metropolitan agriculture program. The 16 problem areas are divided into 6 units: Orientation to Agricultural Occupations (2 problem areas), Supervised Occupational Experience (1), Leadership in Horticulture/Agriculture (3), Horticultural/Agricultural Mechanics (4), Plant Propagation (1), and Plant Identification (5). Each problem area includes some or all of the following components: suggestions to the teacher, teacher's guide (objectives, suggested interest approaches, anticipated student problems and concerns, suggested learning activities, suggested uses of problem area, evaluation, references and aids), information sheets, student worksheets or assignment sheets and key, job sheets or laboratory exercises, transparencies, discussion guide for transparencies, and sample test questions and teacher's key. (YLB)

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CORE II MATERIALS FOR METROPOLITAN AGRICULTURE/ HORTICULTURE PROGRAMS

UNITS A-F

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Product Abstract

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16. General Description (State the general objective and suggested method in use. Summarize the content and tell how it is organized. Continue on back of this sheet or on another sheet, if necessary.)

This curriculum guide includes 28 problem areas selected as suggested areas of study to be included in a core curriculum for tenth-grade or second-year students enrolled in a metropolitan agriculture program.

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LIST OF UNITS AND PROBLEM AREAS

METROPOLITAN AGRICULTURE PROGRAM

CORE II

UNIT A: Orientation to Agricultural Occupations

PROBLEM AREAS:

1. Orientation to vocational horticulture course and S.O.E.P.
2. Developing effective study habits

UNIT B: Supervised Occupational Experience

PROBLEM AREAS:

1. Keeping S.O.E.P. records using the Floriculture Record Book

UNIT C: Leadership in Horticulture/Agriculture

PROBLEM AREAS:

1. Participating in individual and group activities in youth organizations
2. Developing leadership skills
3. Developing basic public speaking skills

UNIT D. Horticultural/Agricultural Mechanics

PROBLEM AREAS:

1. Cement masonry and concrete work
2. Managing greenhouse electrical systems
3. Servicing small gas engines
4. Glazing

UNIT E: Plant Propagation

PROBLEM AREAS:

1. Propagating herbaceous plants by grafting

UNIT F: Plant Identification

PROBLEM AREAS:

1. Identifying turfgrasses and turfgrass weeds and using turfgrasses in the landscape
2. Identifying trees and shrubs in the landscape
3. Identifying vines and ground covers in the landscape
4. Identifying and using annual and perennial flowers in the landscape
5. Identifying and caring for flowering and foliage house plants

UNIT G: Growing and Managing Horticultural Crops

PROBLEM AREAS:

1. Growing bedding plants
2. Growing greenhouse flowering crops from seeds and cuttings
3. Growing container nursery crops
4. Growing bulb crops

UNIT H: Identifying and Controlling Pests of Horticultural Plants

PROBLEM AREAS:

1. Identifying and controlling landscape and garden pests

UNIT I: Urban Animals

UNIT J: Soil Science and Conservation of Natural Resources

PROBLEM AREA:

1. Fertilizing horticultural crops

UNIT K: Agricultural Products

PROBLEM AREAS:

1. Identifying and selecting fresh fruits and vegetables
2. Identifying and selecting ornamental horticultural products

UNIT L: Landscape Design Establishment and Maintenance

PROBLEM AREAS:

1. Designing and drawing a landscape plan
2. Establishing and maintaining a turf area
3. Constructing patios and walkways
4. Transplanting and caring for trees and shrubs

SUGGESTIONS FOR USING CORE MATERIALS

These instructional materials and teaching aids have been designed to improve instruction and increase student learning. Each problem area includes some or all of the following components:

1. Suggestions to the teacher
2. Teacher's guide
3. Information sheets
4. Student worksheets or assignment sheets and key
5. Job sheets or laboratory exercises
6. Transparencies
7. Discussion guide for transparencies
8. Sample test questions and teacher's key

This combination of instructional materials is intended for use as a source unit. This means that teachers should selectively choose those components and those parts which they need to achieve their teaching objectives. The project staff does not recommend that teachers "teach" the core program as it is presented. Instead, teachers should personalize and localize the materials for the particular group taught and, wherever possible, add other materials and teaching techniques to enrich the core program.

Teachers could teach all problem areas included in the core curriculum to a specific class, but this would not be advisable considering the variations which exist in agriculture programs, students' needs and interests, and program objectives. Instead, teachers should select problem areas for a "local core" and supplement them with other problem areas important in the local area. Another suggestion is that the entire problem area need not be taught to a given group during a given year. For example, teachers may want to teach part of the parliamentary procedure problem area to freshmen and teach the remaining part to an advanced class.

Specific suggestions for using the different components of a problem area are presented in the following section.

1. Suggestions to the teacher. These suggestions are included on the first page of each problem area. Teachers should read these suggestions before problem areas are scheduled for the year. Decisions need to be made regarding which problem areas will be taught, when they will be taught and the approximate number of days to be devoted to each problem area. On the basis of these decisions, teachers can construct a course calendar.

   In some cases, the suggestions also indicate the preplanning that needs to be accomplished before instruction begins. Instructional materials not included in the problem area need to be ordered in advance.

2. Teacher's guide. The teacher's guide is not a lesson plan. It is a source of teaching ideas which may be used by the agriculture teacher to conduct an effective instructional program. Each

guide includes more material than most teachers would use. Teachers should select from the several interest approaches and teaching activities those suggestions which seem more appropriate for the local situation. The teacher's guide emphasizes a problem solving method and a student-centered, activity approach. Lecture-presentation, rote memorization of facts and subject-matter mastery should be kept to a minimum. The teacher's guides include suggestions for carrying learning to the "doing" level. Application of classroom learning to S.O.E.P.'s and FFA activities is an important part of the teaching process.

3. Information sheets. These sheets have been prepared for those problem areas where subject matter may be difficult to locate. If reference materials are not available, the teacher may want to duplicate copies of the information sheets for class use.
4. Student worksheets or assignment sheets and keys. These exercises are designed as classroom activities for student use. They may provide a change of pace for students when they have grown tired of other activities which may be overused. Most exercises include a teacher's key with suggested answers.
5. Job sheets and laboratory exercises. In some problem areas, such as the agricultural mechanics areas, job sheets have been provided which include a step-by-step procedure for performing horticultural jobs. These sheets may be used to guide students engaged in individualized learning and to take a load off the busy teacher who has a large class involved in a variety of learning activities.
6. Transparencies. Some of the problem areas include transparency masters which can be used to prepare overlays and others include small reproductions of transparencies developed for the Core Project which are available from Vocational Agriculture Service, University of Illinois.
7. Discussion guide for transparencies. Most of the transparencies included in the core materials do not include on the overlay any narration or explanation. The discussion guide provides teachers with some suggested points to bring out in the discussion of a transparency including explanations, descriptions and discussion questions related to the transparency.
8. Sample test questions and key. The sample test questions are not intended to be used as a test. The teacher can select questions from those included in the problem area if they are appropriate and add others as needed. Some teachers may choose not to administer a test at the close of each problem area and to prepare a comprehensive test at the end of a unit.

The numbering system found at the bottom of each page includes five digits or letters. The first character is a capital "M", which stands for Metropolitan. The Roman numeral II designates the material as part of Core II. The letters which run from A-L designate the unit. The fourth character is a numeral which indicates the problem area within the unit (1 means first, 2 for second, etc.). The last digit is the page number. All pages are numbered consecutively and the pages in each problem area start with "one."

The color scheme used in the Illinois Core Curriculum is as follows:

Salmon--Suggestions to the Teacher

Tan--Teacher's Guide

Light Blue--Information Sheets

Ivory--Student Worksheets

Pink--Job Sheets/Laboratory Exercises

Lime--Teacher's Key to Student Worksheets

White--Transparencies and Transparency Discussion Guides

Green--Sample Test Questions and Teacher's Key

Raspberry--Suggested Content Outline

METROPOLITAN AGRICULTURE PROGRAM ADVISORY COMMITTEE

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   DuSable High School

   Carl Reed
   Barrington High School

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   District 214

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UNIT A: Orientation to Agricultural Occupations

PROBLEM AREAS:

1. Orientation to vocational horticulture course and S.O.E.P.
2. Developing effective study habits

UNIT A: ORIENTATION TO AGRICULTURAL OCCUPATIONS

PROBLEM AREA: ORIENTATION TO THE VOCATIONAL HORTICULTURE COURSE AND S.O.E.P.

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year students enrolled in an horticultural occupations program. The recommended time for teaching this problem area is at the beginning of the school year. The estimated time for teaching this problem area is 1 to 2 days depending on how much time the teacher wishes to spend on discussion and conducting the suggested exercises. The materials in this problem area were selected and written with the following assumptions:

1. That the students will have completed one year of Vocational Horticulture and youth organization activities.

2. That all students will carry an approved S.O.E.P. and belong to the local FFA chapter or other approved youth organization.

The instructor is encouraged to conduct a local search to locate other supplementary materials. The items in this problem area are for reference or modification as the teacher adapts this problem area to his/her local situation.

CREDIT SOURCES:

These materials were developed through a funding agreement, R-33-32-D-0542-388 with the Illinois State Board of Education, Department of Adult, Vocational and Technical Education, Research and Development Section, 100 North First Street, Springfield, Illinois 62777. Opinions expressed in these materials do not reflect, nor should they be construed as policy or opinion of the State Board of Education or its staff.

The teacher's guide and worksheets were developed by Jerry Pepple, Department of Vocational and Technical Education, University of Illinois. The membership record forms were developed from examples in the FFA Adviser's Handbook. The "FFA Facts" sheet was prepared by The National FFA Center, Alexandria, Virginia.

Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Pilot Test Teachers.

TEACHER'S GUIDE

I. Unit: Orientation to agricultural occupations

II. Problem area: Orientation to the vocational horticulture course and S.O.E.P.

III. Objectives: At the close of this problem area the students will:

1. Be familiar with the type of units and problem areas which will be covered in the second-year horticulture course.

2. Understand the local policies and procedures for the second-year horticulture course.

3. Be able to update the local department copy of their personal information card.

4. Be able to update their S.O.E.P. record books.

IV. Suggested interest approaches:

1. Distribute the planned course outline to the students. Let the students react to the course outline and make possible suggestions on specific topics which are of interest to them.

2. Discuss the possible learning activities (field trips, FFA activities) which the students will have the opportunity to participate in throughout the year. Use information sheet, "FFA Facts" to develop discussion and interest in FFA.

3. Point out the major skills and knowledge areas which the students will master by the end of the year.

4. Post a monthly calendar in the room and have students fill in all Hort. and FFA activities. Do this each month to keep students informed.

V. Anticipated problems and concerns of students:

1. What will we be studying this year?

2. What is the FFA?

3. What FFA contests can I participate in this year?

4. How do I get the Chapter FFA Degree?

5. What do I need to do to my S.O.E.P. record book that was used last year?

6. When will we have an FFA or youth club meeting?

7. What happened at the State FFA Convention this summer?

8. What happened at the National Horticulture Convention this summer?

9. What was done during the summer on the school land laboratory and in the school greenhouse?

10. Will we need new notebooks this year or use the same one we had in our first year?

11. When will we be working in the greenhouse or land lab.?

12. Will I need any special supplies for this course?

VI. Suggested learning activities and experiences:

1. Distribute the students' Personal Information Sheet for them to fill out and update. For an example form, refer to Core I problem area "Introduction to the school program.

2. Distribute Student Worksheet 1 "Member Record Forms" and have students record their previous school related activities.

3. Develop a list of youth club activities on poster board and display the list so the students can sign up for these activities.

4. Plan a field trip to the school land laboratory or greenhouse and explain to students the jobs which have been done since last spring. Use Student Worksheet 2 "Land Laboratory Field Trip." Have students complete the worksheet for their notebook.

5. Arrange for the FFA Chapter Delegates to the State FFA Convention to speak to the class concerning the highlights of the convention, use Information Sheet, "FFA Facts", for discussion.

6. Answer student questions concerning the requirements and the deadlines for application for the Chapter FFA Degree.

7. Have students prepare and present a short oral report on their summer activities which relate to their S.O.E.P. or youth club events.

8. Fill in the necessary information on the Orientation Transparencies as an aid in discussing course requirements.

VII. Suggestions for using this problem area:

1. This problem area should introduce the students to the benefits and advantages of applying for the Chapter FFA Degree and provide an opportunity for the students to obtain an appropriate application form.

2. The students should become familiar with the course content and the objectives and requirements for the course.

3. This problem area should provide students with the opportunity to update their S.O.E.P. record books.

VIII. Evaluation:

1. Collect the students' personal data sheets and check for completion.

2. Evaluate the students' oral reports.

3. Collect and evaluate the students' S.O.E.P. record books.

IX. References and aids:

1. Student notebooks

2. Student S.O.E.P. record books

3. Course outlines

4. Student personal data sheets

5. Student worksheets

6. FFA Advisor's Handbook, National FFA Center, Box 15160, Alexandria, Virginia 22309.

7. Ohio Four Year Vocational Horticulture Record Book (0413), Ohio Agricultural Education, Curriculum Materials Service, Room 254, 2120 Fyffe Road, The Ohio State University, Columbus, Ohio 43210*

*Not approved for Illinois FFA Competition.

INFORMATION SHEET

FFA FACTS

The Future Farmers of America is . . .

...the national organization of high school students preparing for careers in agricultural production, processing, supply and service, mechanics, horticulture, forestry, natural resources and professions. FFA chapters are establishd in public schools offering instruction in vocational agriculture under provisions of the National Vocational Education Acts.

FFA was organized nationally in 1928 in Kansas City by vocational agriculture students who had formed local and state organizations, some dating back to 1917. In 1950, Congress granted the FFA a Federal Charter. Today, there are 8,236 chapters in 50 states as well as in Puerto Rico and the Virgin Islands. Active membership is 482,611.

The primary aim of the FFA is to develop agricultural leadership, cooperation and citizenship. Through participation in FFA activities, young men and women, ages 14-21, interested in all aspects of the agricultural industry, learn how to speak in public, conduct and take part in meetings, handle financial matters, solve their own problems, and assume civic responsibility.

FFA members elect their own officers and plan and carry out activities with a minimum of supervision from their vocational agriculture instructor who serves as chapter advisor. FFA judging contests, public speaking contests, and incentive awards for chapters and individual members complement the classroom instruction and challenge students to excel.

Degrees of membership are awarded on the basis of individual achievement in the organization. The member begins as a Greenhand and progresses to the Chapter Farmer Degree in the local chapter. The State FFA Degree is presented by the State FFA Association, and the American Farmer Degree is presented by the National FFA Organization.

The National FFA Organization has offices near Alexandria, Virginia, where the organization owns and operates the National FFA Supply Service, The National FUTURE FARMER Magazine, the Program Division, and an FFA Alumni Association.

The Future Farmers of America Foundation, Inc., supports the FFA through incentive awards to FFA members and chapters. Foundation funds are provided by businesses, industries, organizations and individuals to recognize FFA achievements at local, state, and national levels.

The FFA Alumni Association was founded in 1972 to give former members and all FFA supporters an opportunity to strengthen the organization. FFA Alumni at the local, state and national levels make substantial contributions of time and resources to assist in the continued growth and development of the FFA.

STUDENT WORKSHEET #1

MEMBER RECORD FORMS

CANDIDATE'S PARTICIPATION IN YOUTH CLUB ACTIVITIES FOR AWARDS AND RECOGNITION

List below activities such as horticulture judging, crop and soil judging, FFA foundation awards, FFA band, chorus. On state and national winnings, indicate where under "Placing."

School Year	Activity	Level of Participation	Placing

COOPERATIVE ACTIVITIES SPONSORED BY THE FFA/YOUTH CLUB

List in this section only those FFA activities that involve group planning or group participation such as: cooperative buying or selling, use of cooperative credit, cooperation with participating organizations in community chapter enterprises, land reclamation, soil conservation, reforestation, educational tours, parent-member banquets, sponsorship of local fairs, and preparation of chapter exhibits for fairs and shows.

School Year	Activities Indicating Cooperation	Level of Participation	Scope Number	Responsiblity

M-II-A-1-9

LEADERSHIP ACTIVITIES SPONSORED BY THE FFA/YOUTH CLUB

List in this secton only activities that provide leadership participation such a public speaking, radio and TV programs, parliamentary procedure contest, leadership school, FFA camp, chairperson of committees on banquets or other special leadership events.

School Year	Leadership Activity	Level of Participation	Status or Ranking such as Delegate, Chairman, etc.

LEADERSHIP IN SCHOOL AND COMMUNITY ACTIVITIES OTHER THAN FFA

List in this section only activities not sponsored by the FFA that provide leadership participation such as: class officer, officer of Sunday School class, officer of Honor Society, captain of athletic team, officer in participating organization, member of breed associations, school, and civic organizations, and showing non-FFA or crops.

School Year	Activity and/or Organization	Level of Participation	Length of Services Responsibilities, Awards

IMPROVEMENT PROJECT ACTIVITIES

Use this form to record work activities as they were completed during the year. Include unusual factors which helped or hindered. Use more than one line if needed.

Date	Diary Entry	Student Labor	Hours of Other Man Labor
	TOTAL HOURS		

EVALUATION

List here the major accomplishments which resulted from your improvement project. Also give your suggestions for changes you would make if you were to repeat the project.

STUDENT WORKSHEET #2

REPORT ON VISIT TO LAND LABORATORY
OR GREENHOUSE

I. DATE: _____ NAME: _____

II. MAP OF LABORATORY (show location of enterprises):

III. PURPOSE OF VISIT: _____

_____

_____

IV. ENTERPRISES ON LABORATORY OR IN GREENHOUSE (type and quantity):

A. _____ D. _____

B. _____ E. _____

C. _____ F. _____

V. CONDITION OF ENTERPRISES (stages of growth or development):

A. _____

B. _____

C. _____

D. _____

E. _____

F. _____

VI. MAJOR PROBLEMS WITH ENTERPRISES: (identify weeds, insects, etc.)

A. _____

B. _____

C. _____

VII. MAJOR JOBS TO BE COMPLETED NEXT: _____

_____

_____

_____

VOCATIONAL HORTICULTURE
COURSE DESCRIPTION

INSTRUCTOR:

PHONE NUMBER:

CLASSROOM NUMBER:

FREE PERIOD:

PREREQUISITE:

COURSE DESCRIPTION:

TEXTS:

HORTICULTURE PROJECTS:

SAFETY:

MISCONDUCT:

GRADES:

REQUIREMENTS:

CLASS PREPARATION:

NOTEBOOKS:

ASSIGNMENTS:

ATTENDANCE:

S.O.E.P.:

FFA:

UNIT A: ORIENTATION TO AGRICULTURAL OCCUPATIONS

PROBLEM AREA: DEVELOPING EFFECTIVE STUDY HABITS

SUGGESTIONS TO THE TEACHER:

At least three separate aspects of the horticultural/agricultural occupations teacher's job can be identified. These three aspects are as follows:

1. Motivating the student to learn.
2. Teaching the student how to learn.
3. Presenting subject matter and directing student learning activities.

This problem area addresses the second aspect of the teacher's job; namely, teaching the student how to learn. It includes materials related to problem-solving skills, use of the student notebook, field trip procedures and rules, how to study, notetaking skills, and effective listening. Approximately 2-3 days should be scheduled in early September for this problem area. Teachers should modify and adapt the content of the problem area to fit their methods and teaching style. Even though this problem area is included in Core II, it could be taught to freshmen as well as sophomores.

CREDIT SOURCES:

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The Information Sheets on Notetaking Skills, Pre-reading Techniques and Cloze Procedure and Cloze Test were developed by Natalie Miller, Reading Instructor, Academic Skills Center, Joliet Junior College, Joliet, Illinois. The remaining materials in this problem area were developed by Paul Hemp, Department of Vocational and Technical Education, University of Illinois and field tested by the Rural and Metropolitan Field Test Teachers.

TEACHER'S GUIDE

I. Unit: Orientation to agricultural occupations

II. Problem area: Developing effective study habits

III. Objectives: At the close of this problem area students will -

1. Understand the problem solving approach to teaching and why it is used.

2. Know how to keep a notebook or class notes.

3. Understand how to conduct themselves on a field trip

4. Be able to use effective study skills and learning procedures.

IV. Suggested interest approaches:

1. Ask class lead questions such as the following:

   a. Are you satisfied with what you are learning in school?

   b. Do you feel you should learn more?

   c. Are your grades acceptable to yourself, your parents, a prospective employer, a college admissions officer?

   d. Do you enjoy school and learning?

2. Describe and define the scope and nature of the problem area indicating major topics or areas to be covered.

3. Explain why effective study habits are important.

4. Emphasize the importance of "learning to learn."

5. Ask students to identify ways that vocational agriculture is different from other courses with respect to teaching methods, class activties and out-of-class work.

6. Inform the class of your teaching style. Help them to understand your expectations.

7. Ask class to repeat the FFA Motto and to explain what "Learning by Doing" means.

8. Help class develop a list of objectives for this problem area to set the stage for problem identification.

V. Anticipated problems and concerns of students:

Lead a class discussion to identify problems and concerns of students. Write the list on the chalkboard.

Teaching methods

1. What teaching methods do you use?

2. What is problem solving and how does it work?

3. Can we bring problems from home for the class to study?

4. Do we have anything to say about what problems will be studied in class?

Student notebooks

1. Do we have to keep a notebook? Will it be graded?

2. What should we keep in our notebooks?

3. Can we take our notebooks home?

4. Why do we keep notebooks?

Field trips

1. How many field trips will we take this year?

2. How should we dress for a field trip?

3. What rules are we supposed to follow when we go on a field trip?

4. Will you grade us on what we learn on field trips?

Supervised study

1. What is supervised study? How often will we have it?

2. What sources of information can we use in looking up answers to questions?

3. Why don't we use a single textbook like they do in other courses?

4. How can we make effective use of supervised study periods?

5. When should we use the following to locate information?

   a. Books
   b. Magazines
   c. Bulletins
   d. Circulars
   e. Resource persons

6. How should we use an index? table of contents?

7. What is meant by "skimming" a reference?

8. How can we tell if we are good readers?

9. How can we improve our reading skills?

Listening and speaking skills

1. When should we talk and when should we listen?

2. What is meant by a "good listener?"

3. Will we be graded on how much we talk in class?

4. Do we have to raise our hands to get permission to talk?

5. How can we take good notes?

Preparing for examinations

1. How often will we have tests or examinations?

2. What kinds of questions will be on these tests or examinations?

3. How can we prepare for tests and examinations?

4. What should we do with an exam after it has been graded and returned?

VI. Suggested learning activities and experiences:

1. Inform the class about the teaching methods you plan to use. Discuss the following:

   a. Problem solving approach
   b. Lecture-presentation
   c. Demonstrations (job instruction)
   d. Other methods you use

2. Explain to the class how they can or cannot be involved in determining what is to be studied.

3. Explain the steps involved in the problem solving approach to teaching. Modify the following steps to match your teaching procedure:

   a. Interest approach - determining where we are, present and past experiences
   b. Determine goals (where we want to go)
   c. Identify problems - explain why students should help identify these problems
   d. Solve problems, answer questions through supervised study
   e. Develop solutions and conclusions
   f. Plan for application outside of class to SOEP's or FFA
   g. Evaluate results

4. Inform class about your notebook policy. Discuss the following:

   a. Are notebooks required?
   b. How should they be used?
   c. Evaluation procedures

5. Use Transparencies on "Keeping a Notebook" to explain to class what they are expected to record in their notebooks.

6. Develop a system for storing notebooks in the agriculture classroom.

7. Use Information Sheets on Notetaking Skills and Pre-reading techniques to teach students effective study habits

8. Discuss questions concerning field trip policies and procedures

   a. Purposes of field trips
   b. Examples of field trips
   c. Preparations to be made
   d. Field trip rules

9. Distribute Information Sheet on "Supervised Study." After students have read the handout, conduct a discussion to answer problems and concerns in this area.

10 Identify ways that students can improve their listening habits. Emphasize paying attention to whomever is speaking, shutting out distractions, and maintaining good eye contact with the teacher or speaker.

11. Have students "test" their listening skills by listening to a short presentation by the teacher and then writing down or repeating what he or she said.

12. During class discussions, ask a student to summarize or report back what another student has said. This promotes good listening habits and provides students with practice in how to listen.

13. Use the Laboratory Exercises, "Improving Listening Skills" for student practice in developing better listening habits and skills.

14. Explain the grading system used by discussing the following:

    a. How course grades are calculated.
    b. How a paper is graded including spelling and grammar mistakes.
    c. How notebooks and record books are graded. Use Information Sheet on Notebook Evaluation Score Card.

15. Discuss ways students can prepare for tests and examinations. Include the following:

    a. Reviewing class notes
    b. Memorizing important subject matter
    c. Handling make-up work

16. Use the Cloze Procedure to determine if student's reading ability matches the level of difficulty of the text material.

VII. Application:

1. Most of what the student learns in this problem area will be used in his or her school work now or in the future.

2. Skills in locating information and solving problems should transfer to out-of-school situations and be used as life skills for years to come.

VIII. Evaluation:

1. Testing is not recommended for this problem area.

2. Results of student learning should show up throughout the year as students become more effective learners.

IX. References and aids:

1. Materials included with this problem area.

2. Notebooks, sample references and other learning material available in the classroom.

INFORMATION SHEET

SOURCES OF AGRICULTURE INFORMATION

Students enrolled in agricultural occupations courses usually use a variety of sources to learn about agriculture. A wide range of problems and topics are discussed in agriculture courses and these problems and topics vary from school to school. This means that it is difficult to use a single textbook or reference which would cover the problem areas or topics studied in a particular course. Some of the information sources you should use in your study of agriculture and suggestions on how to use them follow:

1. Reference books: Most agriculture departments have a collection of agriculture reference books which students can use during supervised study. These reference books usually contain detailed information which may not be included in circulars or subject matter units. Students should explore agriculture references and become familiar with one or more books in each agriculture area such as livestock, horticulture, soils, agricultural mechanics, field crops, etc.

2. Subject matter units: Vocational Agriculture Service at the University of Illinois publishes many short units ranging from 4-16 pages in length. These units are written on problem areas commonly taught in high school agriculture classes and include study questions for student use. The units are written for high school level students and are prepared by agricultural educators who were former high school teachers of agriculture.

3. Circulars: These booklets are prepared on a variety of agriculture subjects and written in language that can be understood by farmers and consumers. Most of the agriculture circulars used in high school classes are published by agriculture staff members at a university.

4. Bulletins: These booklets usually report research matters and are often too technical for most high school students. They have limited use as instructional material for high school students.

5. Magazines: Most schools subscribe to a large variety of agriculture magazines. These magazines are interesting reading and include recent developments and new ideas. Sometimes, information and practices in magazines have not been subjected to field testing nor proven in practice.

6. Filmstrips, transparencies, films: Visuals are an excellent source of agriculture information which portray pictures and drawings which cannot be communicated with printed words.

7. Resource persons: Agriculture students can obtain useful information from their parents, employers, agriculture workers and

business people. Every community offers a rich resource of people who know a great deal about agriculture and are willing to help students learn. Your instructor will probably invite resource persons to class to speak on selected topics.

INFORMATION SHEET

SUPERVISED STUDY

What is supervised study?

Supervised study is an individualized learning activity which involves reading, looking up information, answering questions or performing other written assignments. It is "supervised" by the teacher and conducted during class time.

Why do we have supervised study?

Students learn better when they search out answers and "discover" solutions to problems for themselves than they do when the teacher "gives" them the answer. During supervised study, students learn how and where to locate information and how to evaluate subject matter from various sources.

What should students do during supervised study?

First, the assignment including the problems to be solved, the questions to be answered or the material to be studied should be clearly understood. Secondly, supervised study should be a quiet time with students working independently. A suggested procedure to follow during supervised study is as follows:

1. Get necessary references and materials.

2. Locate information by using the table of contents or index.

3. If the teacher has assigned specific pages of a reference, read the assignment first and then, go back and find answers to the assigned questions.

4. Take notes on scratch paper. Your notes or answer are tentative. The final and correct answer will be obtained later from class discussion.

5. If the information you find is different from information given in other sources, evaluate the source. Check the date of the publication and the credibility of the author or publisher.

6. Prepare yourself to present answers and solutions to the class during the discussion period.

Supervised study involves more than looking up information or answering questions. It helps students to learn about problem solving, to become familiar with various informaton sources and to use information to solve real-life problems.

INFORMATION SHEET

NOTEBOOK EVALUATION - SCORE CARD

EVALUATION	E VG G F P U	MAXIMUM POSSIBLE SCORE
1. Content		40
2. Organization		20
3. Completeness		20
4. Neatness		10
5. Accuracy		10
6. Extra Credit		
	TOTAL	100

KEY:

E = Excellent
VG = Very Good
G = Good
F = Fair
P = Poor
U = Unacceptable

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INFORMATION SHEET

LEARNING ABOUT THE PROBLEM SOLVING METHOD

1. Starting the class.

   Before we can begin class, we need to get settled in our seats with necessary supplies such as pencils, paper, notebooks and other materials ready to use.

   The teacher will take the roll and make announcements or ask students to announce upcoming events or activities.

2. Interest approach.

   A few minutes may be used at the beginning of a problem area or the beginning of the class to identify the problem area to be studied and to accomplish the following:

   a. Find out what students know about the problem area.
   b. Create or increase students' interest in the problem area.

3. Establishing class objectives.

   Ask students to identify objectives for the problem area in terms of one or more of the following:

   a. Why the problem area should be studied.
   b. What learning outcomes are planned.
   c. What students should be able to do at the close of the problem area.

4. Identifying student problems and concerns.

   Class members should help decide what is to be studied and learned by identifying:

   a. List of problems and concerns
   b. List of skills to be learned

   The teacher should supplement the student list if necessary.

5. Developing the learning plan

   The teacher and the class should decide the order of learning activities to follow and make plans for conducting these learning activities.

6. Trial solution

   Students should answer those questions which can be answered by class discussion of what students already know.

7. Supervised study

A supervised study period should be conducted to locate new information and to answer questions which the trial solution period did not answer.

8. Group discussion to arrive at answers and solutions

Class members report back what they have learned and answers are recorded for all problems and concerns.

9. Summary and application

Class members summarize problem area by listing approved practices, principles or generalizations which apply.

Students decide how they are going to apply what they have learned to their S.O.E.P. or to the FFA.

10. Evaluation

As determined by the teacher.

INFORMATION SHEET

NOTETAKING SKILLS

Students usually need assistance in two areas of notetaking: confining their writing to the main points of the lecture or discussion so they can concentrate on listening and organizing their notes so the notes will be useful at a later point.

The instructor has the responsibility of presenting an orderly lecture or discussion, stressing important information, and pacing the class session so the student can follow the discussion. The instructor also needs to point out to the student the benefits which can be achieved through effective notetaking.

The purpose of notetaking is to permit the student to record a brief, orderly progression of the topics covered during a lecture or discussion session so these notes can then be reviewed over a regularly spaced time period. Notes which are stored away until the night before an exam lose their effectiveness. Educators know that more than sixty per cent of what was learned is forgotten within the first seventy-two hours after hearing it; therefore, students need to be taught to use their notes as a daily studying tool.

While there are many notetaking techniques which may be recommended, the one which gives the greatest variety of practice is the Cornell method as developed by Walter Pauk and modified here for use by horticulture or agriculture students. It has the benefits of an easy style and encourages regular review of notes on the part of the student. It also stresses the problem solving approach in comparison to rote memorization of lecture material and will assist a student in preparing for (or practicing) an exam on a daily basis.

INFORMATION SHEET

STUDENT DIRECTIONS FOR NOTETAKING

1. Divide your notebook page into two segments, leaving one-third of the space on the left side and the other two-thirds on the right side. An 8½ by 11 notebook works the best.

2. Always place the topic of the discussion on the top of the page. This can be determined from the material that had been read for the class or the topic that the instructor announces at the beginning of the class.

3. Place the date at the top of the notes.

4. Number each page.

5. The right hand side of the page will be the column in which the student takes notes during class. Write the notes in a form with which you are comfortable. You may wish to outline the session or you may wish to write phrases or other brief notes. Be sure to leave a couple of spaces between topics. You may need this when you review your notes.

6. If the teacher writes information on the chalkboard be sure to copy it in your notes.

7. If other students ask questions or contribute to the discussion you should also include this in your notes.

8. Learn how to listen and summarize the main points. Do not write all the time or you may not hear something important the teacher is saying because you are so busy writing.

9. Do not stop taking notes until the class is over. It is very important to include the summary that the teacher makes at the end of the class.

10. The important part of notetaking comes after the class is over. You should read over your notes the same day that you take them. The following steps will help you prepare for exams beginning with the very day you took the notes:

    a. Look at each topic that you have covered in your notes that you took on the right hand side of your paper.

    b. Now ask yourself "What question might the teacher ask on the test about this information?"

    c. Write the question in the left hand column opposite the notes you took in class.

    d. Continue through your notes in this same manner.

e. If you find a topic that is not clear so you cannot think of a good question to write down you should either go to your textbook and try to clarify it or ask your teacher for a further explanation.

f. You have now constructed a practice test. If you are careful in thinking about the information you recorded in your notes, and if you write specific questions, you may find that you have very accurately predicted possible questions that will be a real test your teacher will give you.

g. Go over your notes with the questions every day. Read the questions that you have made, cover up the "answers" on the right side of your paper, and see if you have mastered the material.

On the next page you will see a sheet set up in the manner in which you should prepare your notes. With practice you will find that your study skills have improved because you are thinking about what you wrote down and you are also studying them every day.

INFORMATION SHEET

SAMPLE NOTETAKING FORM

Record Today's Date and Topic

RECALL COLUMN	RECORDING COLUMN
2. After class read over notes. In this column write a question based on the material on the right. Try to make it as much like a test question as you can.	1. Take notes in class or from your text as usual but write everything on this side of page. Leave space between each topic.
3. Recite and review by read question here.....	Covering information on this side of page and write down the answer as you think it appears here, Now, uncover this information and check to see if your answer was correct.

INFORMATION SHEET

PRE-READING TECHNIQUES

An interesting insight into student's study habits can be gained by asking them how they would begin to read an assignment. "If you were assigned a pamphlet on Identifying Tree and Shrub Insects to read by the next class session, where and how would you begin?" Most students would reply that they would simply turn to the first page and begin reading. In other words, they have no specific purpose for reading and therefore probably have low retention, lack of interest, and an aversion to the printed page.

To illustrate to the students the need for establishing a purpose for reading, one might give them this example: "On Saturday I plan to drive to Rockford to meet a friend. He drives a blue 1981 Ford Thunderbird. When I arrive in Rockford I drive systematically through the town, first going up and down all of the east-west streets looking for my friend. (You may illustrate this progression on the board.) I have covered all of the east-west streets and still have not located my friend, so now I will drive up and down all of the north-south streets. Do you think I located my friend? Why not? But was I not thorough in my search? I covered the entire town, street by street." The students will usually reply that it is futile to drive around the streets of a strange town hoping to locate someone with nothing more concrete than the description of a car. Someone may volunteer the information that an address would be needed--one needs to have a specific location before beginning the search.

Students may be very amused to think of someone driving around a strange town hoping to find a friend. The point can then be made that the habit of opening a book and starting to read through the chapter without a specific plan of attack is equally inefficient.

A classic previewing technique which was developed by Francis Robinson is an effective method for assisting students in improving their retention of textbook reading through immediate direct involvement. This method is called SQ3R and it includes surveying, questioning, reading, reciting, and reviewing.

Step 1: Survey, or preview the material to be read by skimming over it very rapidly. If there are headings, read the headings. If there is a summary or if there are questions at the end of the chapter, read this first. The surveying step should also include looking over charts or illustrative material to see how it relates to the reading material. During the survey step attention should also be paid to unfamiliar vocabulary.

Step 2: Question. Go back over the material and turn the headings into questions. This will help the reader remain active by directing attention toward the location of the answer.

Step 3: Read. Break the article or chapter into segments. Read to find the answer to the first question. Do not underline or make notes during the reading, but continue to the end of the first segment. By completing the reading before underlining, the student can determine the main idea and relevant details. Keep underlining to a minimum.

In the margin of the book make brief notes summarizing the content of each paragraph.

Step 4: Recite. Use the notes written in the margin like a test question. Check the answers against the material in the paragraph. Encourage students to master one segment, paragraph or section before going on to the next.

Step 5: Review. After the article has been read using questions and notes written in the margins, the entire article or chapter can be reviewed by returning to the margin notes, testing one's memory, and checking the answers against the paragraphs.

Once this technique has been taught, students may need to be encouraged to follow it until they have mastered its approach. The following fact sheet from Cooperative Extension Service may be used as an example.

INFORMATION SHEET

THE CLOZE PROCEDURE

The cloze procedure is an effective method to determine if the student's reading ability matches the level of difficulty of the text material. As a teacher you will then be able to adjust the material if it is too difficult or too easy for the student. The cloze test is easy to prepare and to administer and it has the advantage of using materials that you commonly assign for your class.

The cloze technique is based on the principle that students can use clues provided by the author's organization, language structure, and vocabulary to complete the passage.

1. Select a 300 word passage near the beginning of the text or article. Later selections may be too dependent upon concepts taught earlier and therefore may not be a valid indication of a student's ability to read the text. This material should be taken from a chapter which has not been read by the student.

2. After typing in the introductory paragraph, begin test by deleting every 5th word with approximtely 50 for the total passage. Be sure to keep the length of the spaces uniform, approximately 15 spaces.

3. Instruct students to read all the way through the selection before attempting to write in answers.

4. When scoring: Do not count synonyms. Do not penalize for misspelling. Raw score will be the correct replacement. Multiply X 2 to find percentage.

5. To obtain student placement for test find the percentage correct.

   Above 60% - text too easy
   40-60% - text appropriate for instruction
   Below 40% - text too difficult

A sample cloze technique taken from Lawn Establishment. University of Illinois at Urbana-Champaign: Circular 1066, 1972, is included in this problem area as an example.

INFORMATION SHEET

COOPERATIVE EXTENSION SERVICE

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
COLLEGE OF AGRICULTURE

CONTAINER SOILS ARE DIFFERENT

L. Art Spomer
Department of Horticulture

Almost everyone has grown plants in containers. What is a container? It is any receptacle filled with soil or other growth media in which plants are grown. The commonly used containers include pots, flats, planters, cans, boxes, cartons, greenhouse benches, and baskets.

containers hold media in which plants grow.

Most floricultural crops are produced in containers. Most other horticultural crops (with the exception of field crops) are propagated from seeds or cuttings and are grown in containers until they are large enough to transplant into ground beds in gardens or yards. House plants and an increasing number of landscape plants in urban areas are grown exclusively in containers. Container culture, therefore, is a very important aspect of horticulture. So anyone concerned with floricultural crop production and sales must know something about container soils. Although containers are widely used in floriculture, few floriculturists realize that container soils are different from ground bed soils.

containers are used for house plants and landscape plants.

The soil's most important function in relation to plants is to store and supply the water and minerals essential for plant growth and survival. It is not enough for the soil to merely CONTAIN water and minerals; they must be AVAILABLE to the plant.

Soil stores and supplies water and minerals.

A number of soil and plant factors affect the availability of water and minerals in the soil to plants. One of the most important is soil aeration. That is the supply of oxygen to and the removal of carbon dioxide from the plant roots. Good aeration is essential for adequate root growth and absorption, by which the plant grows and survives.

Good soil aeration is needed for plants to survive

All soils consist of a semirigid mass of minute solid particles permeated by a network of interconnected pores in which water, mineral nutrients, and air move and are retained. A container soil is isolated from the ground by the container and is usually open to the atmosphere at the top (surface) and bottom (drainage holes). The depth of a container soil is the vertical distance between the surface and drainage level.

Water, minerals, nutrients and air move through soil pores.

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Container soils have two important characteristics that distinguish them from ground bed soils: container soils are small and shallow (Figure 1). The effect of the relatively small volume of soil in a container is obvious. The reservoir in the soil of water and minerals available to container plants is much less than to those growing in ground beds; therefore, this reservoir must be replenished by frequent irrigation and fertilization to maintain equivalent growth by plants in containers.

Container soils have limited amounts of water and nutrients, so irrigation and fertilization are necessary.

The effect of shallowness in relation to container soils is less obvious. It can be demonstrated easily, however, with an ordinary flat cellulose sponge, like the one you use to scrub the bathroom or car. Place the sponge flat on the level, spread the fingers of one hand, and saturate the sponge by pouring water on it until water drips from the bottom. The sponge, like the soil, is permeated by pores that are full of water when the sponge is saturated. In other words, the sponge is a good model, or analog, of a container of soil. The sponge behaves like soil. After water ceases to drip from the flat sponge, placing it on end will permit more water to drain out (its water content decreases). Merely increasing the height of the sponge by turning it up on end decreases its water content.

A sponge has similar water holding characteristics as soil.

Increasing the height of the sponge decreases its water content.

A real container soil behaves the same way. Actually, a perched water table forms at the bottom of the container soil (the drainage level), even though it has free drainage (open at bottom). Like any water table, the soil is saturated (the pores are filled with water); also, the water content decreases with the height above the water table.

Soil pores at the bottom of a container are filled with water.

Because of this "container soil effect," an excellent garden or field soil placed in a container will probably remain saturated following watering and drainage and result in poor soil aeration and poor plant growth. Even if the container is filled with coarse sand or perlite, the soil may remain saturated following irrigation and may be poorly aerated because of its shallowness. The deeper the container soil, the smaller its surface and average water content following watering and drainage.

Garden soil used in containers usually has poor soil aeration.

The effects of the container's smallness and shallowness create a dilemma. The soil in a container holds an inadequate supply of water and minerals to maintain growth for more than a short period; yet, that same soil may be too wet for the plant to absorb even this inadequate supply. The effects of the container's small size can be remedied by frequent watering and fertilization; however, that also increases the frequency of poor aeration (due to the shallowness of container soil).

Necessary watering and fertilizing increases the frequency of poor aeration.

The effects of shallowness can be remedied by incorporating coarse-textured amendments (sand, sawdust, peat, perlite, bark, vermiculite, calcined clay, and the like) into the soil creating large pores that will drain after watering, despite the perched water table at the container bottom. However, insufficient amendment worsens aeration instead of improving it;

The addition of coarse textured soil amendments will improve soil aeration.

and excess amendment results in insufficient water retention for growth. Although the relatively small size and shallowness of containers do create problems for growing plants, the problems can be minimized by proper irrigation and fertilization and by using soil amendments.

Too little amendments worsens aeration and too much cuts water retention.

Remember that CONTAINER SOILS ARE DIFFERENT. Therefore, they require different care than garden or field soils.

Container soils are different from garden soils.

LABORATORY EXERCISES

IMPROVING LISTENING SKILLS

I. Directing and Maintaining Attention

1. Have the students close their eyes and listen for a number of seconds. Ask them to list the different sounds they heard during that time.

2. Read a short selection from an agriculture reference. Ask students to count the number of times they hear a particular word such as "a," "and" or "the."

3. Read aloud rapidly the following words:

Holstein	Hampshire
Tractor	Mower
Harrow	Cultivator
Duroc	Guernsey
Brown Swiss	Poland China
Plow	Ayrshire

Ask individuals or teams to remember and report back the names of either farm implements, dairy breeds or swine breeds.

II. Following Directions

1. Play Simple Simon.

2. Play games involving the cutting and folding of paper, drawing, or writing according to oral directions.

3. Have students listen to and repeat directions that might be given to a traveler attempting to reach a particular place.

III. Listening to the Sounds of our Language

1. Have one team supply a word. The second team is to supply a rhyming word in a matter of seconds.

2. Read words in groups of three, four, or five. Have students identify the words that do or do not rhyme.

IV. Using Mental Reorganization

1. Read telephone or ZIP code numbers aloud and ask students to record them on paper.

2. Read aloud a series of numbers or letters with one-, two-, or three-second pauses after each. Following these sequence of three, four, five, or six, ask students to write the numbers or letters they can remember.

V. Finding Main Ideas and Important Details

1. Have students listen to a short selection and suggest a title.

2. Read three statements, one containing a main idea and the other two containing subordinate ideas. Have the students select the one that contains the other two. For example:

   All life on earth depends on the sun.
   The sun provides us with heat during the day.
   Ocean plants get their energy from the sun.

VI. Critical Listening

1. Have students listen to speeches recorded at State or National FFA Conventions in which speakers have strong views or opinions. As they listen, they should keep the following questions in mind:

   a. What is the speaker's purpose or motive?
   b. What emotionally toned words or phrases does he/she use to sway the listeners?
   c. Are the views presented based on fact or opinion?
   d. Does the speaker sell points by the use of propaganda techniques or by logic?
   e. Do the statements agree or conflict with my experience?
   f. What is the importance of the speech to others and to me?

2. Recorded radio and television commercials provide stimulating practice in detecting the more common propaganda techniques: name calling, transfer, testimonial, plain folks, band wagon, card stacking, glittering generalities, and repetition. As students listen they would attempt to classify the appeal or appeals used.

LABORATORY EXERCISE

CLOZE TEST

Modifying the Soil

Turfgrasses can survive and persist on almost any soil, provided nutrients, water, and aeration are adequate. A sandy loam to loam soil, however, is preferred since turfgrass quality is generally better and management requirements are less stringent. An existing soil may be considered unsuitable because of poor drainage (as in clayey soils) or poor water- and nutrient-retaining capacity (sandy soils). On turfed soils subjected _____ heavy traffic, resistance to _____ is a highly desirable _____. Most soils can be _____ to improve their physical _____ significantly.

To improve aeration _____ drainage and to reduce _____ potential for compaction, soils _____ in clay may be _____ with organic matter (peat, _____ sawdust, etc.), sand or _____ coarse aggregates such as _____ clay. A fibrous peat (_____) is preferred over muck, _____ the latter frequently contains _____ amounts of dispersed clay _____ silt that may clog _____ pores and actually reduce _____ and aeration. Sand should _____ used to amend an existing soil only if enough _____ is available to make _____ resulting mixture that is _____ least 50 to 80 _____ sand. Smaller quantities may _____ do more harm than _____, and the resulting mixture _____ be more compactible than _____ original soil. Calcined clay, _____ synthetic material formed by _____ clay granules at very _____ temperatures, may be substituted _____ sand on a one-for-one _____. The quantities required and _____ cost of calcined clay _____ sand may limit their _____ for soil modification.

Drouthy, _____ soils may be improved _____ the addition of organic _____ or finer textured mineral _____. A 2-inch layer of _____ additive materials, incorporated to _____ total depth of 6 _____, may substantially improve the _____ capacity of the original _____ and also provide for _____ storage of essential plant _____. Alternatively, enough soil of _____ desirable properties can be _____ to cover the existing _____ by at least 6 inches. This is usually the most expensive method of soil amendment and, depending upon the quality of available soil, may not be the best answer. Any additional soil purchase should be free of quackgrass rhizomes and vegetative plant parts of other undesirable perennial grasses, for if such grasses develop in the new lawn, they cannot be controlled selectively with the herbicides presently available.

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Under a vigorously growing turf, soil conditions generally will eventually improve without soil modification. This is a relatively slow process, however, and may be offset by the compacting effects of severe traffic.

TEACHER'S KEY

LABORATORY EXERCISE

CLOZE TEST

Modifying the Soil

Turfgrasses can survive and persist on almost any soil, provided nutrients, water, and aeration are adequate. A sandy loam to loam soil, however, is preferred since turfgrass quality is generally better and management requirements are less stringent. An existing soil may be considered unsuitable because of poor drainage (as in clayey soils) or poor water- and nutrient-retaining capacity (sandy soils). On turfed soils subjected ___to___ heavy traffic, resistance to compaction is a highly desirable ___characteristic___. Most soils can be modified to improve their physical ___properties___ significantly.

To improve aeration ___and___ drainage and to reduce ___the___ potential for compaction, soils ___high___ in clay may be ___diluted___ with organic matter (peat, rotted sawdust, etc.), sand or ___other___ coarse aggregates such as ___calcined___ clay. A fibrous peat (___sphagnum___) is preferred over muck, ___as___ the latter frequently contains ___large___ amounts of dispersed clay ___and___ silt that may clog ___soil___ pores and actually reduce drainage and aeration. Sand should ___be___ used to amend an existing soil only if enough ___sand___ is available to make a resulting mixture that is ___at___ least 50 to 80 percent sand. Smaller quantities may ___actually___ do more harm than ___good___, and the resulting mixture ___may___ be more compactible than ___the___ original soil. Calcined clay, ___a___ synthetic material formed by ___firing___ clay granules at very ___high___ temperatures, may be substituted ___for___ sand on a one-for-one ___basis___. The quantities required and ___the___ cost of calcined clay or sand may limit their ___use___ for soil modification.

Drouthy, ___sandy___ soils may be improved with the addition of organiic ___matter___ or finer textured mineral ___soils___. A 2-inch layer of ___these___ additive materials, incorporated to ___a___ total depth of 6 inches, may substantially improve the ___water-holding___ capacity of the original ___soil___ and also provide for ___better___ storage of essential plant ___nutrients___. Alternatively, enough soil of more desirable properties can be ___purchased___ to cover the existing ___soil___ by at least 6 inches. This is usually the most expensive method of soil amendment and, depending upon the quality of available soil, may not be the best answer. Any additional soil purchase should be free of quackgrass rhizomes and vegetative plant parts of other undesirable perennial grasses, for if such grasses develop in the new lawn, they cannot be controlled selectively with the herbicides presently available.

Under a vigorously growing turf, soil conditions generally will eventually improve without soil modification. This is a relatively slow process, however, and may be offset by the compacting effects of severe traffic.

KEEPING A NOTEBOOK

I. ENTERPRISE OR UNIT _____

II. PROBLEM AREA _____

III. OBJECTIVES:

1.
2.
3.
4.

IV. PROBLEMS AND CONCERNS:

1.
2.
3.
4.
5.
6.
7.
8.

V. SOLUTIONS AND ANSWERS:

1.
2.
3.
4.
5.

VI. CONCLUSIONS AND APPROVED PRACTICES:

VII. STUDENT APPLICATIONS:

1.
2.
3.

VIII. REFERENCES AND AIDS:

1.
2.
3.

UNIT B: Supervised Occupational Experience

PROBLEM AREAS:

1. Keeping S.O.E.P. records using the Floriculture Record Book

UNIT B

UNIT B: SUPERVISED OCCUPATIONAL EXPERIENCE

PROBLEM AREA: KEEPING S.O.E.P. RECORDS USING THE FLORICULTURE RECORD BOOK

SUGGESTIONS TO THE TEACHER:

A problem area on "Keeping Records on an S.O.E. Program" was included in the Illinois Metropolitan Agriculture Program Core I. This problem area covered the use of the two record books; namely, "My Plant Diary" and "Fruit or Vegetable Production."

The problem area included in Core II covers the use of another record book available from Vocational Agriculture Service. The Floriculture Record Book is one of a series of record books used in connection with the Illinois FFA Foundation Program. Other FFA Foundation Record Books related to horticulture are as follows:

Home and Farm Improvement
Turf and Landscape Management
Nursery Operations

Instruction in the use of these record books could be given during the first or second year of horticulture. Since most improvement projects are conducted on a calendar year basis, records could be started on January 1; however, some teachers prefer to have students begin their improvement projects in the early fall months.

Teachers who plan to teach this problem area should order a supply of record books and the S.O.E.P. problems from Vocational Agriculture Service.

CREDIT SOURCES:

These materials were developed through a funding agreement R-33-32-D-0542-388 with the Illinois State Board of Education, Research and Development Unit, 100 N. First Street, Springfield, Illinois 62777. Opinions expressed herein do not reflect, nor should they be construed as policy or opinion of the Illinois State Board of Education or its staff.

The materials included in this problem area were prepared by Paul Hemp, Department of Vocational and Technical Education, University of Illinois.

TEACHER'S GUIDE

I. Unit: Supervised occupational experience

II. Problem area: Keeping S.O.E.P. records using the Floriculture Record Book.

III. Objectives: At the close of this problem area students will:

1. Be able to keep records on a floriculture improvement project using the Floriculture Record Book.

2. Understand how the Floriculture Record Book can be used to apply for an FFA Foundation Award.

IV. Suggested interest approaches:

1. Initiate or follow a policy that all students must conduct at least one improvement project for their S.O.E.P. and that records must be kept on this project. If this policy is followed, students understand that they need to know how to use the record book in order to meet course requirements.

2. Review the Illinois FFA Foundation Award Program with students to motivate them to develop and conduct improvement projects and to learn how to keep records on these projects. Use FFA materials from Metro Core I.

3. Explain the importance of keeping good records and how they can be used.

4. Show students examples of record books kept by former students. Display examples on the bulletin board or check them out to students for review.

V. Anticipated problems and concerns of students:

1. What records do I need to keep on my floriculture project?
2. Where can I obtain a record book?
3. How should entries be recorded?
4. When should entries be made?
5. When should records be started?
6. When should records be closed?
7. Should I use pencil or pen to keep my records?
8. How will my record book be evaluated?
9. What is the purpose of the parent-student agreement?
10. What is an improved (approved) practice?
11. What is an inventory?
12. How can I calculate my net worth?

VI. Suggested learning activities and experiences:

1. Review material covered in the Core I problem area "Keeping Records on an Urban Supervised Occupational Experience Program."

2. Distribute copies of the Floriculture Record Book and review major sections with students.

3. Explain school or department policy on S.O.E. programs and record book requirements.

4. Distribute copies of S.O.E.P. Problem for Floriculture Record Book and explain the assignment.

5. Provide class time for students to make entries in the record book and provide individual help as needed. Use Teacher's Key as a guide.

6. Evaluate and discuss students' work.

7. Show students examples of other FFA Foundation books and how they differ from the Floriculture Record Book.

VII. Application procedures:

1. Each student should be encouraged or required to keep records on at least one improvement project each year.

2. Class time should be scheduled each week or month for students to bring their records up to date.

3. Students should also be encouraged or required to keep records in "My Plant Diary" and the "Fruit and Vegetable Production" book.

VIII. Evaluation:

1. Evaluate and grade entries made in practice record book.

2. Grade other record books and count as part of student's S.O.E.P. grade.

IX. Reference and aids:

1. Floriculture Record Book available from Vocational Agriculture Service.

2. S.O.E.P. Problem for Floriculture Record Book available from Vocational Agriculture Service.

S.O.E.P. PROBLEM FOR FLORICULTURE RECORD BOOK

My name is Mary Mum. I live at 381 Addison Drive, Rose City, Illinois. I am 15 years old and a sophomore at Rose City High School. This is my first year in Horticulture and the FFA. My father's name is Henry Mum, my mother's name is Marge Mum, and my horticulture teacher's name is M. J. Mooney.

My parents have agreed to support me in my S.O.E. activities. They will pay for all costs connected with my home improvement projects during 1982-83.

The horticulture units to be taught in the course I am enrolled in are as follows:

Unit	Class Hours
Soils and Fertilizers	10
Plant Identification	18
Plant Propagation	15
Supervised Occupational Experience	7
FFA Activities	4
Growing Flowers	12
Corsages	6
Parliamentary Procedure	7
Floriculture Careers	13
Floral Arrangements	15
Greenhouse Management	10
Insects and Diseases	9
Gardening	20
New Developments in Floriculture	20

The activities which I would like to conduct this year for my S.O.E.P. are as follows:

Activity	Time Schedule
Building a table or bench	March, 1983
Setting out iris flower bed	April, 1983
Setting out fruit trees	April, 1983
Landscaping home grounds	April and May, 1983
Painting picnic table	November, 1982
Painting mailbox	February, 1983
Growing houseplants	January, 1983
Making Christmas wreaths	December, 1982

My work record for the 1982-83 school year is as follows:

Date	Summary of Work Done	Hrs. Worked	Income
11/10	Sanded table	2	
11/16	Painted table	2	

Date	Summary of Work Done	Hrs. Worked	Income
11/20	Ordered supplies for wreaths	1	
11/1-30	Cared for house plants	10	
12/6	Prepared frames for wreaths	3	
12/15	Made 5 wreaths	10	
12/16	Delivered wreaths	2	$35.00
12/20	Made 3 wreaths	5	
12/21	Delivered wreaths	1½	$21.00
1/5	Potted new plants	5	
1/9-30	Caring for plants	10	
1/22	Repotting	3	
2/10	Painted mailbox	3	
2/1-28	Caring for house plants	12	
3/4	Drawing plans	2	
3/6	Constructed bench	2½	
3/1-31	Caring for plants	9½	
4/3	Digging iris bulbs	2	
4/3	Spaded soil	3	
4/3	Planted bulbs	2	
4/12	Dug holes	6	
4/13	Planted 5 trees	3	
4/13	Pruned trees	1	
4/20	Install edging	4	
4/24	Lay meremac rock	3	
4/27	Plant yews	3½	
5/3	Cultivate shrubs	2	
5/7	Plant flowers	3	
5/10	Dust roses	1	

The most significant skills I learned this year include drawing plans, making wreaths, learning about plants, meeting customers and identifying horticulture plants. Improved practices I used for my S.O.E.P. included treating iris bulbs, mixing soil, keeping complete records, potting plants, sterilizing soil. I had no initial inventory, but at the end of the year, I owned the bench I built which was valued at $20.00

The achievements in floriculture which were most important to me were as follows:

October	Preparing a budget	2 hrs.
Nov. 20	Locating supply sources	1 hr.
Dec. 8	Taking and filling orders	3½ hrs.
Jan. 5	Selecting soil mixes	1 hr.
April	Selecting structures	2 hrs.
April	Selecting cultivars	2 hrs.
May	Dusting roses	2 hrs.
May	Transplanting	1½ hrs.

My assets on November 1, 1982 were $30.00 cash on hand, $110 in my checking account and $8.00 worth of plants. On May 31, 1983, I had $25.00 cash, $200 in my checking account, $29.00 worth of plants and a bench worth $20.00. I had no liabilities at the beginning or the end of the year.

Leadership achievements and school-community activities which I participated in were as follows:

1. 1982 - FFA Chapter Secretary
2. On December 20, I had the lead role in the school Christmas play.
3. I served as class vice-president this year and was a member of the church choir.
4. I served on the FFA Earnings and Savings Committee and applied for the FFA Foundation Award in Floriculture (my instructor said I had to be a junior to compete).
5. I participated in a Horticulture Career Day (Jan. 20) a 4-H Leadership School (April 30) and attended the Flower Show (March).

Mr. Mooney visited me three times during the school year. On December 14, he helped me get started with my wreaths. On April 3, he assisted me and my parents in the development of plans for landscaping the yard and our iris bed. On May 10, he took pictures of some of my projects. At the end of May, Mr. Mooney wrote the following in my Floriculture Record Book:

> "Mary is off to a good start with her S.O.E.P. She is not eligible for an FFA Foundation Award this year, but if she continues to improve, she will be a strong candidate next year. Her performance and progress have been excellent."

RECORDS OF MY SUPERVISED EXPERIENCE PROGRAM

FLORICULTURE RECORD BOOK

NAME Mary Mum

CHAPTER Rose City

SCHOOL Rose City

ILLINOIS FOUNDATION FFA

School Year 1982-1983

M-II-B-1-9

Name of FFA Member Mary Mum Chapter Rose City

Home Address 381 Addison Drive Age 15

Year in school 10 Years in Agriculture 1 Years in FFA 1

A. PARENTAL AGREEMENT

1. I agree to assist in the achievement of this project insofar as I am able.
2. I agree that the student (may_____, may not ✓) be expected to pay any costs incurred with this experience program, except for items which are his own property or at the student's discretion.
3. Special Arrangements_____

B. STUDENT AGREEMENT

1. I agree to make a study of this experience program listing those practices which my instructor and I feel may be adapted to my program and experience.
2. I agree to keep a progressive record of accomplishments achieved.
3. I agree to conduct the activities connected with this program.
4. I will carry out these activities as my experience program.
5. Special_____

C. ADVISOR AGREEMENT

1. I agree to assist the student with needed instruction in FLORICULTURE.
2. I agree to make periodic visits and supervise work done on this program.
3. Additional_____

Henry Mum
Parent

Mary Mum
Student

J M Mooney
Teacher

Other

M-II-B-1-10

TOTAL SCHOOL INSTRUCTION IN FLORICULTURE

School Yr.	Unit, Job, or Problem	Class Hours
1982-1983	Soils and Fertilizers	10
"	Plant Identification	18
"	Plant Propagation	15
"	Supervised Occupational Experience	7
"	FFA Activities	4
"	Growing Flowers	12
"	Corsages	6
"	Parliamentary Procedures	7
"	Floriculture careers	13
"	Floral Arrangements	15
"	Greenhouse Management	10
"	Insects and Diseases	9
"	Gardening	20
"	New Developments in Floriculture	20

PROPOSED MAJOR ACTIVITIES IN FLORICULTURE

ACTIVITY	Mo. & Yr. Planned
Building a table or bench	March, 1983
Setting out iris flower bed	April, 1983
Setting out fruit trees	April, 1983
Landscaping home grounds	April & May '83
Painting picnic table	November, 1982
Painting mailbox	February, 1983
Growing houseplants	January, 1983
Making Christmas Wreaths	December, 1982

RECORD OF SUPERVISED EXPERIENCE PROGRAM

Month November 1982				Month December 1982			
Date	SUMMARY OF WORK DONE	Hours Worked	Income	Date	SUMMARY OF WORK DONE	Hours Worked	Income
11/10	Sanded table	2		12/6	Prepared frames for wreaths	3	
11/16	Painted table	2		12/15	Made 5 wreaths	10	
11/20	Ordered supplies for wreaths	1		12/16	Delivered wreaths	2	$35.00
11/30	Cared for house plants	10		12/20	Made 3 wreaths	5	
				12/21	Delivered wreaths	1½	$21.00
	TOTAL FOR MONTH	15			TOTAL FOR MONTH	21½	$56.00

RECORD OF SUPERVISED EXPERIENCE PROGRAM

Month January 1983				Month February 1983			
Date	SUMMARY OF WORK DONE	Hours Worked	Income	Date	SUMMARY OF WORK DONE	Hours Worked	Income
1/3	Potted new plants	5		2/10	Painted mailbox	3	
1/9-30	Caring for plants	10		2/1-28	Caring for house plants	12	
1/22	Repotting	3					
	TOTAL FOR MONTH	18			TOTAL FOR MONTH	15	

M-II-B-1-13

RECORD OF SUPERVISED EXPERIENCE PROGRAM

Month March 1983				Month April 1983			
Date	SUMMARY OF WORK DONE	Hours Worked	Income	Date	SUMMARY OF WORK DONE	Hours Worked	Income
3/4	Drawing plans	2		4/3	Digging iris bulbs	2	
3/6	Constructed bench	3		4/3	Spaded soil	3	
3/8	Constructed bench	2½		4/3	Planted bulbs	2	
3/10-31	Caring for plants	9½		4/12	Dug holes	6	
				4/13	Planted 5 trees	3	
				4/13	Pruned trees	1	
				4/20	Install edging	4	
				4/24	Lay mersmac. rock	3	
				4/27	Plant yews	3½	
	TOTAL FOR MONTH	17			TOTAL FOR MONTH	27½	

M-II-B-1-14

RECORD OF SUPERVISED EXPERIENCE PROGRAM

Month May 1983				Month _____ 19__			
Date	SUMMARY OF WORK DONE	Hours Worked	Income	Date	SUMMARY OF WORK DONE	Hours Worked	Income
5/3	Cultivate shrubs	2					
5/7	Plant flowers	3					
5/10	Dust roses	1					
	TOTAL FOR MONTH	6			TOTAL FOR MONTH		

RECORD OF SUPERVISED EXPERIENCE PROGRAM

Month ______ 19__				Month ______ 19__			
Date	SUMMARY OF WORK DONE	Hours Worked	Income	Date	SUMMARY OF WORK DONE	Hours Worked	Income
	TOTAL FOR MONTH				TOTAL FOR MONTH		

RECORD OF SUPERVISED EXPERIENCE PROGRAM

Month________________19___ Month________________19___

Date	SUMMARY OF WORK DONE	Hours Worked	Income	Date	SUMMARY OF WORK DONE	Hours Worked	Income
	TOTAL FOR MONTH				TOTAL FOR MONTH		

FINANCIAL SUMMARY

Month	Employer(s)	Total Hours	Gross Pay	Social Security Tax	Income Tax Fed.	Income Tax State	Other	Take Home Pay
TOTALS	XXXXX							

INDICATE THE MOST SIGNIFICANT SKILLS AND COMPETENCIES DEVELOPED THROUGH YOUR SUPERVISED EXPERIENCE PROGRAM IN FLORICULTURE. (Examples: Use of basic artistic forms in floral arrangements, matching customer's requests to shop prices, use of cash register, producing cut flowers.)

1.
2. Drawing plans
3. Making wreaths
4. Learning about plants
5. Meeting customers
6. Identifying horticultural plants
7.
8.
9.
10.

IMPROVED PRACTICES: List the most significant improvement practices that were initiated because of your efforts that increased the efficiency and/or production of your Floriculture Operations. (Examples: Introduced the use of CO_2 to stimulate plant growth, introduced the use of shading to improve efficiency.)

1. Treating iris bulbs
2. Mixing soil
3. Keeping complete records
4. Potting plants
5. Sterilizing soil
6.

ACHIEVEMENTS IN FLORICULTURE

ITEMS	DATE	NUMBER	HOURS	COST	COMMENTS
MAKING PLANS					
Selecting Structures	April		2		
Determining Investment Costs					
Locating Supply Sources	11/20		1		
Preparing a Budget	Oct.		2		
PROVIDING PROPER ENVIRONMENT					
Heating & Ventilation					
Selecting Soil Mixes	1/5		1		
Regulating CO_2					
Regulating Light					
FERTILIZING & WATERING					
Planning Fertilizer Program					
Regulating Fertilizer Equipment					
Planning Watering					
Regulating Irrigation					
PROPAGATION AND GROWTH (Including Cost Comparisons)					
Selecting Plants & Cultivars (Varieties)	April		2		
Taking Cuttings & Sticking Plants					
Pinching, Pruning, Disbudding					
Transplanting or Thinning	May		1½	—	

ACHIEVEMENTS IN FLORICULTURE

ITEMS	DATE	NUMBER	HOURS	COST	COMMENTS
DISEASE, PEST, AND WEED CONTROL					
Dust roses	May		2		
APPLYING GROWTH REG. CHEMICALS					
MOVING, SPACING, SUPPORTING PLANTS					
TESTING GROWING MEDIA OR BENCH SOILS					
Testing for pH or Salts					
Testing for Nutrients					
TIMING CROPS FOR PRODUCTION AND SALE					
ORGANIZING LABOR FOR PEAK SALES					
COMPOSTING					

ACHIEVEMENTS IN FLORICULTURE

ITEMS	DATE	NUMBER	HOURS	COST	COMMENTS
CARE, MAINTENANCE, & SAFETY IN USE OF STRUCTURES & EQUIPMENT					
COST ACCOUNTING					
PREPARING FLOWERS FOR SALE					
Cutting & Grading					
Bunching & Packaging					
Arranging Flowers					
Making Corsages & Centerpieces					
Making Funeral Sprays & Wreaths					
Displaying & Selling					
FILLING ORDERS					
Planning a Delivery System					
Filling & Taking Orders	Dec	8	3½		
Taking Orders by Wire or Phone					
ADVERTISING					

EXPERIENCE GAINED IN MARKETING: Indicate the experience gained in marketing floriculture products or services.

I took orders for Christmas wreaths and delivered wreaths to customer's homes.

INVENTORY

Include only those items concerned with FLORICULTURE owned or owned in partnership as of January 1 that were of value in carrying out your program.

INITIAL INVENTORY (Items owned and their value when entering Agriculture)

Year Purchased	Description of Inventory Item	Source or Origin	Acquisition Cost	Quantity	Percent Owned by Applicant	Value of Applicant's Share
TOTAL	XXXXXXXX	XXXXX		XXX	XXXX	$

ENDING INVENTORY

Year Purchased	Description of Inventory Item	Source or Origin	Remaining Value, End of Year	Quantity	Percent Owned by Applicant	Value of Applicant's Share
1983	Bench	Built	$20.00	1	100%	$20.00
TOTAL	XXXXXXXX	XXXXX	$20.00	XXX	XXXX	$ 20.00

MY FINANCIAL STATEMENT

YEAR: BEGINNING November, 1982 ENDING May 31, 1983

	Beginning of year	End of year
ASSETS:		
Cash on hand	$30.00	$25.00
Cash in checking account	$110.00	$200.00
Cash in savings account		
Market value of the stocks or bonds		
Life insurance (cash value)		
Accounts receivable		
Value of land, buildings, & equipment		
Value of growing floriculture crops	$8.00	$29.00
Value of harvested floriculture crops on hand		
Value of other crops		
Value of livestock and poultry		
Other Assets (List) Table (bench)		20.00
TOTAL ASSETS-----	$148.00	$274.00
LIABILITIES:		
Unpaid bills		
Accounts payable		
Notes (to be paid)		
Other liabilities (List)		
TOTAL LIABILITIES-----		
STUDENT'S NET WORTH-----	$148.00	$274.00
STUDENT'S CHANGE IN NET WORTH-----		$126.00

LEADERSHIP DEVELOPMENT

ACHIEVEMENTS IN FFA

Date	Name of Committee, Office, or Major Activity	Degree of Responsibility
1982	Chapter Secretary	
1983	FFA Foundation Award in Floriculture	
1982-3	Earnings and Savings Committee	Member

SCHOOL AND COMMUNITY ACTIVITIES -- (Not related to FFA)
Activities which you have had a part within the community, county, or state

Date	Activities, Accomplishments or Practices Introduced
12/20	Christmas play - lead role
7/5	Joined 4-H Club
1981-82	Member of church choir
1981-82	Class vice-president

LEADERSHIP DEVELOPMENT (cont'd.)

ACTIVITIES RELATING TO FLORICULTURE
(Not sponsored by the school or FFA)

Include activities such as environmental camps, youth camps, and related career study.

Date	Activity	Degree of Responsibility
1/20	Horticulture Career Day	Participant
4/30	Leadership School - 4-H	
March	Attended Flower Show	

OTHER INFORMATION: In the space below indicate other pertinent information pertaining to the applicant's background such as personal history, size of family, type of family business, practices that applicant has introduced that have been successful, formal training in FLORICULTURE OPERATIONS, opportunities available, factors that influenced starting point, future plans, etc.

EXHIBITS

Indicate the subject and the action being shown. You may submit up to 12 exhibits. These may be news stories, ribbons, or photographs (either black and white or colored), with a brief caption (50 words or less) for each.

NARRATION

Give a brief statement of your activity. Emphasize any items not covered in previous parts of the application and a summary of your major achievements. Include career possibilities that were revealed through this experience program.

SUPERVISED EXPERIENCE PROGRAM VISITS MADE BY TEACHER*

DATE	PURPOSE (Briefly include what was done and recommendations made)
12/14	Mr Mooney helped me get started with Christmas wreaths
4/3	Instructor assisted with plans for iris bed and landscaping projects.
5/10	Mr Mooney took pictures of my projects.

STUDENT'S PROGRAM EVALUATION BY TEACHER

May 85	Mary is off to a good start with her SOEP. She is not eligible for an FFA Foundation Award this year but if she continues to improve, she will be a strong candidate. Her performance and progress have been excellent

* This record shall be kept up-to-date by the student.

This record is presented as our chapter winner in FLORICULTURE for consideration in the Illinois Foundation FFA award program. I certify that the information contained in this record is true, complete and accurate. The applicant meets eligibility requirements for entry in this award program.

Date Submitted _____ Chapter Advisor _____

UNIT C: Leadership in Horticulture/ Agriculture

PROBLEM AREAS:

1. Participating in individual and group activities in youth organizations
2. Developing leadership skills
3. Developing basic public speaking skills

UNIT C

UNIT C: LEADERSHIP IN HORTICULTURE/AGRICULTURE

PROBLEM AREA: PARTICIPATING IN INDIVIDUAL AND GROUP ACTIVITIES IN YOUTH ORGANIZATIONS

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year agriculture students who have been taught the basic leadership or citizenship problem areas in Core I. The recommended time schedule for this problem area is 3 to 5 days in September or early October. Materials for the following FFA activities are included in this problem area:

1. Proficiency Awards
2. FFA Achievement Award
3. Sectional Fairs and Shows
4. FB-FFA Cooperative Activities
5. FB-FFA Heritage Program
6. BOAC
7. Chapter Safety
8. National Chapter Award (Program of Activities)
9. Food for America

Materials on public speaking and parliamentary procedure are included in Core I and materials on degree advancement are included in Core II in the problem area on "Developing Leadership Skills."

Not all of the award programs are included in this problem area. Teachers should supplement the materials to meet local needs. To prepare for the teaching of this problem area, the teacher should do the following:

1. Check to see that copies of the Student Handbook, sample program of activities, state and national FFA materials are on file.

2. Schedule slide sets and/or films from State FFA Office, Roanoke, IL.

3. Duplicate class copies of forms, handouts, and other materials for student use.

4. Coordinate the teaching of this problem area with a motivational program such as the Reporter's Workshop, Leadership Training School or State Officers' visit.

CREDIT SOURCES:

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These materials were prepared by Paul Hemp and Betty Van Dyck, project staff members and Steve Austin, FFA Advisor at Thomson High School, Thomson, Illinois. The Student Worksheet on Activity Selection is taken from An Instructional Packet on Leadership/FFA for Beginning Vocational Agriculture Students by Joe Townsend, Illinois State Univeristy and Richard Carter, Iowa State University and published by Vocational Agriculture Service at the University of Illinois. The problem area was reviewed for technical accuracy by Eldon Witt and John Fedderson, Illinois FFA Office, and field tested by 20 Illinois teachers.

TEACHER'S GUIDE

I. Unit: Leadership in Horticulture/Agriculture

II. Problem area: Participating in individual and group activities in youth organizations

III. Objectives: At the close of this problem area, students will:

1. Know the eleven major divisions of an FFA program of activities.

2. Be able to explain the importance and proper use of the FFA program of activities.

3. Be able to name at least 75% of the proficiency award areas.

4. Be able to name the levels of competition for FFA programs.

5. Be able to describe, explain the purpose and list the general requirements of sectional fairs and shows, FFA Achievement Awards; Cooperative Activities, Heritage Program, BOAC, Chapter Safety, Chapter Award, Food for America Program, and Proficiency Awards.

6. Be willing to serve on at least one FFA standing committee and assist with at least one of the FFA chapter activities included in this problem area.

7. Be willing to develop personal goals involving individual activities in the FFA.

IV. Suggested interest approaches:

1. Distribute copies of programs of activities developed locally in past years or by other chapters and show class what has been included.

2. Ask class to rate the local FFA chapter as "Outstanding" "Good" "Fair" or "Poor."

3. Have students name the sectional, state and national awards won by the chapter last year. Write these awards on the chalkboard and add any that students have forgotten.

4. Find out how many students are interested in working for a state or national FFA degree. Have them name FFA activities which might help them achieve this degree.

5. Distribute copies of the Annual Report of the Illinois Foundation FFA and have students identify sectional winners in each of the proficiency awards for the previous year.

6. Refer to plaques and other awards on display in the horticulture classroom. Explain what each plaque represents.

7. Show one of the following slide sets available from the State FFA Office:

   a. FFA - Agriculture's New Generation
   b. FFA Unites Youth with Opportunities

8. Distribute copies of the FFA catalog to show students the award plaques and materials available to local chapters.

V. Anticipated problems and concerns of students:

1. What FFA activities can our chapter be involved in? (The following FFA activity programs are included in this problem area:)

   a. Proficiency Awards
   b. FFA Achievement Award
   c. Sectional Fairs and Shows
   d. FB-FFA Cooperative Activities
   e. FB-FFA Heritage Program
   f. BOAC
   g. Chapter Safety
   h. National Chapter Award (Program of Activities)
   i. Food for America

2. List these programs on the chalkboard or on an overhead transparency. Then select one program and ask the class a lead question such as "What do we need to know about this program?" The following concerns should be identified: (Note--These problems apply to most of the programs included in this problem area).

   a. What is the purpose of the program or activitiy?
   b. Who is eligible to compete?
   c. What is involved in applying for this award or entering competition for this activity?
   d. What does the winner receive?

3. In addition, ask class to identify general problems or concerns which apply to the award programs and the best ways to get started with them. Some anticipated problems and concerns in this area are as follows:

   a. How do we decide which group activity to conduct?
   b. Where can we learn more about these programs?
   c. Is everyone supposed to participate?
   d. How are the FFA committees appointed?

VI. Suggested learning activities and experiences:

1. Develop a class list of problems and concerns. Conduct supervised study to give students an opportunity to find solutions to problems. Have students read the following:

   Student Handbook - pp. 49-53, 79-95, 114, 119-121.

2. Present additional information to students using transparencies included with this problem area.

3. Have students read Information Sheets and/or review them with the class in a group discussion.

4. Show the following slide sets or films available from the State FFA Office in Roanoke:

   a. Food for America - FFA Tells the Story
   b. A Proficiency Award for You
   c. Journey to Safety
   d. Safety Makes Sense
   e. The Game Plan (BOAC)

5. Use the Worksheet "Planning for Sectional FFA Fairs and Shows" for students to record information presented by the instructor.

6. Explain what should be included in an FFA program of activities and how the program should be developed. Use the Worksheet "Preliminary Program of Activities" to identify members, goals, ways and means, etc. Use Worksheet "Activity Selection Scorecard" to help students select the best activities.

7. Follow through with the program of activities which the group develops. Continuously make reference to it as the guideline for the chapter's activities; remembering that it can be changed, if necessary, through the parliamentary process.

VII. Application procedures:

1. The instructional activities in this problem area should apply directly to the FFA program. Each FFA member should be involved in one or more of the activities studied.

2. Committees should be organized to implement the plans discussed in class.

3. An FFA program of activities should be developed and entered in the Chapter Award Program.

4. The instructional program for Proficiency Awards, FFA Achievement Award and Sectional Fairs and Shows should be conducted so as to lead to applications to students' S.O.E. programs.

VIII. Evaluation:

1. Have each student develop an individual or personal plan for involvement in the FFA programs studied.

2. Collect and grade Worksheets.

3. Administer a pencil and paper test using the sample questions included in this problem area.

IX. References and aids:

1. Official FFA Manual (1980 edition) - National FFA Supply Service

2. Student Handbook - Production Credit Association or National FFA Supply Service

3. AV Materials from State FFA Office, Roanoke or National FFA Supply Service

   a. Food for America
   b. A Proficiency Award for You
   c. Journey to Safety and Safety Makes Sense
   d. Building our American Communities
   e. More than Profit
   f. FFA--Agriculture's New Generation
   g. FFA Unites Youth with Opportunities

4. Illinois Foundation FFA Annual Report, available from the State FFA Office, Roanoke, Illinois 61561

5. FFA Activity Handbook and Chapter Guide to FFA Activities, available from National FFA Supply Service

6. Illinois FFA Advisors' Guide

7. Official FFA Catalog

8. Blue Illinois FFA notebooks containing state and national materials.

INFORMATION SHEET

CHAPTER AWARD PROGRAM

Procedures:

1. Submit a preliminary Program of Activities to the Section FFA President by October 31. It should include at least the following parts:

   a. List of chapter officers.

   b. Budget.

   c. Committees for the eleven divisions with goals and activities for each division.

2. Submit a completed program of activities and the National Chapter Award Program Report Forms (white form) to the Sectional FFA President by a date established by him or her. The National Report Forms consist of Form I which Chapters must submit if they wish to be rated as a Superior Chapter and Form II, required for Gold, Silver, Bronze or Honorable Mention at the State level. Both Forms I and II must be completed and submitted for State competition.

3. To apply for National recognition, a chapter must have received a State rating. Each State Association may submit 10% of their State Superior rated chapters for National competition.

4. If possible, the members of each committee should be in the same class to facilitate committee meeting time. Suggested activities for committees include:

   a. Vice-President should obtain a list of all members and group them by classes.

   b. Elect committee members and chairperson and finalize committee assignment.

   c. Evaluate last year's Program of Activities and make changes where needed.

   d. Have recorded the suggested changes in the Program of Activities. Complete a Committee Meeting Report Form.

   e. Make committee report at next FFA meeting.

INFORMATION SHEET

CHAPTER SAFETY AWARD

1. What is the purpose of the Chapter Safety Award Program?

   To assist the FFA chapters in taking a more active role in safety training.

2. How can a local program be started?

   The safety program should begin with an instructional unit in vocational horticulture or agriculture. Safety should be taught to all students. The FFA Award Program should be an outgrowth or a product of the instructional program.

2. How does the FFA get involved?

   Safety programs should be planned in the FFA Program of Activities. A committee should be charged with the responsibility of organizing and conducting safety projects.

4. What type of awards are provided by the National FFA Foundation?

   State Superior Award
   National Bronze Emblem Award
   National Silver Emblem Award
   National Gold Emblem Award

5. What awards are provided at the sectional and state levels?

   Sectional winners receive a plaque from the Illinois Foundation FFA. The state winner receives a plaque which is issued to chapters receiving the Superior Safety rating for the first time.

6. How can a local FFA chapter enter this program?

   Submit a Form I application to the Section FFA president by April 15 to apply for Superior Safety Chapter recognition. To apply for the Sectional Chapter Safety plaque, and for state and national recognition, submit a Form II application at the same time. Forms I and II are sent to schools in the fall of each year along with other materials from the State FFA Office in Roanoke.

7. Where can we obtain more information or help?

   Illinois FFA Advisors' Guide, pp. 17-18
   National FFA Chapter Safety Award Handbook in the FFA Activity Handbook
   FFA Advisor's Handbook, pp. 169-173
   Materials from State FFA Office, Roanoke, Illinois

INFORMATION SHEET

FOOD FOR AMERICA

1. What is the Food for America program?

   In the Food for America program, FFA chapters tell the story of American food production to elementary school children. It is sponsored by the National FFA Organization which provides all the necessary materials for conducting the activity.

2. What materials are available?

   Free of charge to the FFA Chapter are: "The Food for America Resource Book", containing visual aids, activity sheets, lesson plans and detailed instructions for presenting the program; a film "Food from Farm to You", loaned by the Farm Film Foundation; Food for America poster, and a prepared news release. There are other aids available at a cost.

3. Why is it a good activity?

   It gives FFA members an opportunity to share their knowledge with children and to get some experience presenting information to others. It is also a very good community service project.

4. How do we get involved?

   a. Organize a Food for America Committee

   b. Committee members read the Food for American fold-out found in the "FFA Student Activities Handbook." The steps for organizing and order forms are found in the fold-out.

INFORMATION SHEET

FB-FFA HERITAGE PROGRAM

1. What is the FB-FFA Heritage Program?

   It is a competitive activity designed to inform young people about their heritage and their rights and responsibilities as citizens. It is a joint venture of the Illinois Farm Bureau and Illinois FFA and is offered only in Illinois.

2. What aspects of our heritage and citizenship does the program have us examine?

   a. Agricultural heritage
   b. Flag
   c. State and National elected officials
   d. Election process
   e. Governmental organization
   f. Historical places and people

3. What are some examples of chapter activities in the FB-FFA Heritage Program?

   a. Agricultural Heritage - A community history book was written. An FFA chapter developed and preserved areas of native vegetation
   b. Flag - A chapter sponsored a poster contest in grade school on the history of the flag.
   c. Contacting State and Federal officials - A chapter maintained voting record of state and federal representatives.
   d. Public Elections - FFA chapter members conducted telephone crusade to Get-Out-the-Vote.
   e. Local Government - FFA members attended County Board meetings.
   f. Historical Sites - A chapter presented program on the history of school buildings in the district
   g. Community Heritage - FFA members assisted in restoring community landmarks

4. What awards are available for competing?

   a. Certificates of Participation for local chapters meeting minimum requirements.
   b. Plaques for sectional winners.
   c. Plaques and an award tour for top five chapters in the state. Each chapter selects representative members to go on the tour.

5. Where does our FFA chapter begin if we want to participate in this activity?

   a. Review Part I and Part II of the Heritage Program Award Application. This gives an overview of everything expected to be completed.

b. Select a committee and committee chairperson to organize the program.

6. Where can we get more information on the FB-FFA Heritage Program?

   1981 - 1982 Heritage Program available from State FFA Office in Roanoke, Illinois 61561

INFORMATION SHEET

PROFICIENCY AWARD PROGRAMS

1. What is the purpose of the Proficiency Award Program?

   It provides incentives for students to develop high quality supervised occupational experience programs and record-keeping skills.

2. Who sponsors this program?

   National FFA Foundation and the Illinois FFA Foundation

3. What are the levels of competition where awards may be won?

   Local chapter level
   Sectional level
   District level
   State level
   Regional level
   National level

4. In what three major categories or classifications can these award programs be grouped?

   Production awards
   Non-production awards
   Placement awards

5. Which proficiency award programs fall into these groups?

   Production awards:

   Beef Production
   Corn Production
   Crop Production
   Crop Specialty
   Dairy Production
   Diversified Livestock Production
   Floriculture
   Fruit & Vegetable Production
   Livestock Specialty
   Poultry Production
   Sheep Production
   Small Grain Production
   Soybean Production
   Swine Production

   Non-production awards:

   Agricultural Electrifiction
   Agricultural Mechanics
   Agricultural Processing
   Fish and Wildlife Management
   Forest Management
   Home and Farmstead Improvement
   Horse Proficiency
   Nursery Operations

Non-production awards (cont'd.):

Outdoor Recreation
Safety
Soil and Water Management
Turf and Landscape Management

Placement awards:

Agricultural Sales & Service
Horse Proficiency
Nursery Operations
Placement in Agricultural Production
Turf and Landscape Management

6. Who is eligible to compete for these awards?

Junior or senior FFA members currently enrolled in a vocational horticulture or agriculture course are eligible. In addition, applicant must have completed at least one year in vocational horticulture or agriculture. Schools may have only one application in each area. See Illinois FFA Advisor's Guide for other information on eligibility.

7. What awards are given to winners?

Local - Chapter winner medal for each applicant in the section contest.
Section - Two plaques for each section winner, one for the winner, and one for the chapter.
District - Two district winner bars for first place.
State - Two state winner plaques for first place. Cash awards are provided for winners by State and National FFA Foundations.

8. Where can I obtain additional information?

Student Handbook - pp. 83-95
Illinois FFA Advisor's Guide - pp. 26-37
Agricultural Proficiency Awards Reference in the FFA Activity Handbook

INFORMATION SHEET

FFA ACHIEVEMENT AWARD PROGRAM

1. What is the Achievement Award Program?

   It is an opportunity for every individual FFA member to earn recognition for work they do in their S.O.E.P. activities. FFA members earn recognition for meeting performance standards that they and their advisors set up together. It is designed by and for the individual member. He or she competes against a performance standard, not against others.

2. How does it relate to S.O.E.P.?

   It examines four aspects of the members' S.O.E. program. They are: an exploration of careers in the project area, skills needed for a career in that area, leadership opportunities in the same subject area, and related safety practices.

3. What is the first step?

   The FFA advisor and member together develop a performance checklist as in the sample.

4. What follows?

   As the member completes each activity, the advisor initials the checklist. When 80% or more of the activities have been achieved, the member is presented an Achievement Award Certificate from the National FFA Organization.

5. Where can more information be obtained?

   FFA Achievement Award Program Booklet in the FFA Activities Handbook.

INFORMATION SHEET

COOPERATIVE ACTIVITIES PROGRAM

1. What is the Cooperative Activities Program?

   It is a program designed to give FFA members an understanding of cooperatives as a type of business in the American private enterprise system. It is supported by the Illinois Farm Bureau and Affiliates.

2. What kinds of cooperative activities are involved?

   a. Cooperative buying/financing
   b. Cooperative selling
   c. Cooperative services
   d. Cooperating with other groups

3. What are some examples in each of these categories that other FFA chapters have tried?

   a. Cooperative buying/financing
      Students purchased parts and supplies for shop class through a chapter cooperative.

      Chapter purchased unassembled auto-trouble lights. Assembled them in ag. mechanics class and sold to members for a slight profit, but substantially below retail.

   b. Cooperative selling
      Chapter members sold flowers from projects in greenhouse and purchased new equipment.

   c. Cooperative services
      Chapter owns and rents equipment to members for preparing show animals.

      Chapter collected and tested soil samples for area farmers.

   d. Cooperating with other groups
      Chapter members assisted Farm Bureau, Country Companies and County Sheriff in property I.D. program.

4. What awards are available for competing?

   a. Certificates of participation for local chapters meeting minimum requirements.
   b. Plaques and an award tour for sectional winners and the top five chapters in the state.
   c. The award tour will either be the site of the National Institute on Cooperative Education which alternates among State land grant universities or a suitable tour of various nearby agricultural cooperatives. Each chapter selects deserving member(s) to attend.

5. How do we get started with the program?

   a. The whole membership would review Part I and II of the Cooperative Activities Program award application. This gives an overview of everything the group is expected to do.

   b. Select a committee and committee chairperson to organize the program.

6. Where can we get more information?

   a. 1981-82 Cooperative Activities Program Booklet available from State FFA Office in Roanoke

   b. Films available are:
      "Cooperatives - The Farmer's Way"
      "How People Do Business in our Democracy"
      "Capper - Volstead"

      Order from:

      Illinois Association FFA
      204 Husseman P.O. Box 466
      Roanoke, IL 61561

INFORMATION SHEET

BUILDING OUR AMERICAN COMMUNITIES (BOAC)

1. What is BOAC?

   BOAC is a special project of the National FFA Foundation which is designed to encourage FFA members to study the roles of community leaders, local organizations and local government. It was started in 1971 and is sponsored by the R. J. Reynolds Industries, Inc. of Winston-Salem, N.C.

2. What are the purposes of BOAC?

   a. To give young people an understanding of how community action and progress take place.

   b. To give young people an understanding of their community leaders' jobs.

   c. To encourage them to find out the aims and purposes of the organizations in their community.

   d. To encourage them to study the community and identify its economic, social and environmental needs.

   e. To show young people how they can help their community leaders make their home community a better place to live and work.

3. What awards are available?

   a. All qualified participants receive "area award" plaques from the National FFA Foundation.

   b. State winners (top 50% of area participants) receive a State award plaque and appropriate Gold, Silver, or Bronze spur.

   c. First place chapter in state receives Governor's Citation.

   d. National winners (top 10% of area participants) will be judged by National FFA for Gold, Silver, and Bronze Emblem. These entries receive a National BOAC award plaque with appropriate metal spur.

   e. First place chapter in nation receive the National Citation.

4. How does our chapter start a BOAC program?

   a. Select a BOAC committee and committee chairperson. This may be the community service committee you selected while planning your program of activities or it may be a special committee.

b. Committee members should read "Community Development - FFA Style" which will help you:

(1) to define your community
(2) to identify your community needs
(3) to select community development activities
(4) to gather and analyze solutions
(5) to explore alternative solutions
(6) to organize the project you select
(7) to evaluate the results

5. Where can we get more information?

"Building Our American Communities" in the Student Activities Handbook "Community Development-FFA Style" booklet and slide and tape series from, the BOAC Department, National FFA Center, P.O. Box 15160, Alexandria, VA 22309.

WORKSHEET

PLANNING FOR SECTIONAL FFA FAIRS AND SHOWS

1. Name of fair or show _____

2. Location _____ Date _____

3. Types of exhibits allowed _____

_____

_____

_____

_____

4. Who may exhibit? _____

_____

_____

_____

5. Reasons for exhibiting _____

_____

_____

_____

_____

6. Cost of entry fees _____

7. Premiums offered _____

8. I would like to exhibit the following: _____

_____

_____

_____

_____

_____

WORKSHEET

FFA ACHIEVEMENT AWARD PLANS FOR ANIMAL PRODUCTION

Name _____

Challenge: To develop the skills, abilities and attitudes necessary to enter a job in the broad field of animal production.

Awards: An Achievement Award Certificate will be awarded to you for satisfactorily completing 80% of the skills and tasks you have developed in each of the four areas listed below. When you have satisfactorily completed an activity, ask your evaluator to initial it.

	Evaluator's Initials
Career Exploration	
Visit and prepare a written or an oral report on each of the following:	
1. A local feedlot or dairy	_____
2. A local dairy processing plant	_____
3. The agricultural department of a community or state college	_____
4. Local agricultural extension advisor	_____
5. Local veterinarian	_____
6. A sale at a livestock auction yard	_____
7.	_____
8.	_____
9.	_____
Other:	
10. Work for fifteen hours on a livestock or dairy farm	_____
11. Prepare a livestock market outlook report	_____
12. Fill out a job application	_____
13. Prepare a written report on the opportunities, entrance requirements, working conditions, etc., of two jobs in the field of animal science	_____
14.	_____
15.	_____
16.	_____

Career Skills

Identify and describe the use of the following:

1. Fifteen veterinary instruments _____
2. Twenty livestock handling tools _____
3. Twenty feed ingredients _____
4. Fifteen cuts of meat and ten dairy products _____
5. _____
6. _____
7. _____

Identify and describe:

8. Five dairy breeds _____
9. Fifteen beef breeds including exotics _____
10. Five breeds of sheep _____
11. Five breeds of swine _____
12. _____
13. _____
14. _____

When do you expect to complete this project? _____

Demonstrate a job-entry level of proficiency in:

15. Castrating cattle, sheep and swine _____
16. Administrating sub-cutaneous, intra-muscular and intra-venous injections _____
17. Dehorning and banding or tatooing _____
18. Grading live market animals _____
19. The management of a boar, bull or ram _____
20. The care of new born pigs, calves or lambs _____
21. The care of breeding gilts, cows or flock of sheep _____
22. _____
23. _____
24. _____

Leadership Development

1. Participate in four chapter activities _____
2. Serve as a chapter officer _____
3. Serve on a chapter committee _____
4. Participate in a sectional or regional FFA activity _____
5. Help a younger member with their animal project _____
6. Give a demonstration of a livestock management skill to your class _____
7. Participate in a community service project _____
8. Attend and participant in three chapter meetings _____
9. Assist in one chapter fund raising activity _____
10. Participate in a local or area fair _____
11. _____
12. _____
13. _____

Other

14. Assist one Greenhand with a Supervised Occupational Experience Program _____
15. Recruit one new FFA member _____
16. Submit approved S.O.E.P. record book for local and sectional competition _____
17. _____
18. _____

Safety Practices

1. Demonstrate safe use of ten livestock tools _____
2. Demonstrate safe handling of livestock _____
3. Inspect your own or a local farm and report on the safety hazards found _____
4. Draw or illustrate five safety precautions to observe while working with small animals _____
5. Lead a class discussion on farm safety _____
6. Write a report on the safety practices involved in raising livestock _____
7. Demonstrate a knowledge of fire control practices _____
8. _____
9. _____
10. _____

To be completed by the Vocational Agriculture Instructor at the end of this course.

I do hereby certify that _____ has successfully achieved 80% of the skills and jobs in each of the areas checked below:

___ Career Exploration ___ Leadership Development
___ Career Skills ___ Safety Practices

_____
Advisor's Signature Date

These plans are not designed to meet the needs of any particular student. They are only examples. When developing the individual plans, the student's motivation, area of interest, and ability should be considered.

WORKSHEET

PRELIMINARY PROGRAM OF ACTIVITIES APPLICATION

_____ Chapter

I. Officers:

President _____

V. President _____

Secretary _____

Treasurer _____

Reporter _____

Sentinel _____

II. Budget:

Expected money intake _____

Expected money spent _____

Ways of raising money _____

III. Committees:

A. Supervised Occupational Experience

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

B. Cooperation

1. Chairperson _____

2. Members _____

3. Goals _____

_____

M-II-C-1-23

4. Ways and Means _____

_____

_____

C. Community Service

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

4. Ways and Means _____

_____

_____

D. Leadership

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

_____

E. Earnings, Savings, and Investments

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

_____

F. Conduct of Meetings

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

_____

G. Scholarship

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

_____

H. Recreation

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

_____

I. FFA Public Relations

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

_____

J. Participation in State and National Activities

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

K. Alumni Relations

1. Chairperson _____

2. Members _____

_____

_____

3. Goals _____

_____

4. Ways and Means _____

_____

_____

STUDENT WORKSHEET

ACTIVITY SELECTION SCORECARD

Score activity on a scale of 1 = below average, 2 = average, 3 = above average for each of the following items.

1. Has educational values? _____

2. Develops leadership? _____

3. Requires cooperation of members? _____

4. Stimulates interest and motivates members? _____

5. Promotes FFA and vocational agriculture? _____

6. Financially possible? _____

7. Renders service to community? _____

8. Contributes to development of S.O.E. programs? _____

9. Develops member's pride? _____

10. Contributes to personal development? _____

11. Contributes to improvement of agriculture? _____

COMPONENTS OF A PROGRAM OF ACTIVITIES

SECTION I:

MEMBERSHIP ROSTER (ACTIVE AND HONORARY) SECTIONAL, STATE AND NATIONAL OFFICERS STANDING COMMITTEES

SECTION II:

CALENDAR OF ACTIVITIES

SECTION III:

BUDGET

SECTION IV:

PROGRAM FOR EACH OF ELEVEN STANDING COMMITTEES

ELEVEN STANDING COMMITTEES OF A GOOD PROGRAM OF ACTIVITIES

1. Supervised Agricultural Occupational Experience
2. Cooperation
3. Community Service
4. Leadership
5. Conduct of Meetings
6. Earnings, Savings and Investments
7. Scholarship
8. Recreation
9. Public Relations
10. Participation in State and National Activities
11. Alumni Relations

CHAPTER PROGRAM OF ACTIVITIES
PLANNING SHEET

DIVISION _____

DIVISION OBJECTIVE _____

_____

_____

COMMITTEE CHAIRMAN _____

MEMBERS _____

_____

A ACTIVITY/B. GOALS	WAYS & MEANS	BUDGET	COMPLETION SCHEDULE GOAL	COMPLETED

M-II-C-1-31

COMMITTEE ACTIVITY PLANNING SHEET

COMMITTEE _____ OFFICER _____

CHAIRMAN _____ MEMBERS _____

SECRETARY _____ _____

OTHER _____ _____

PROJECT _____

STARTING TIME _____

COMPLETION TIME _____

ACTIVITIES PLANNED	MEMBERS RESPONSIBLE	COST	START TIME	COMPLETION TIME
1.				
2.				
3.				
4.				
5.				

M-II-C-1-32

SOME INDIVIDUAL AND CHAPTER AWARD ACTIVITIES

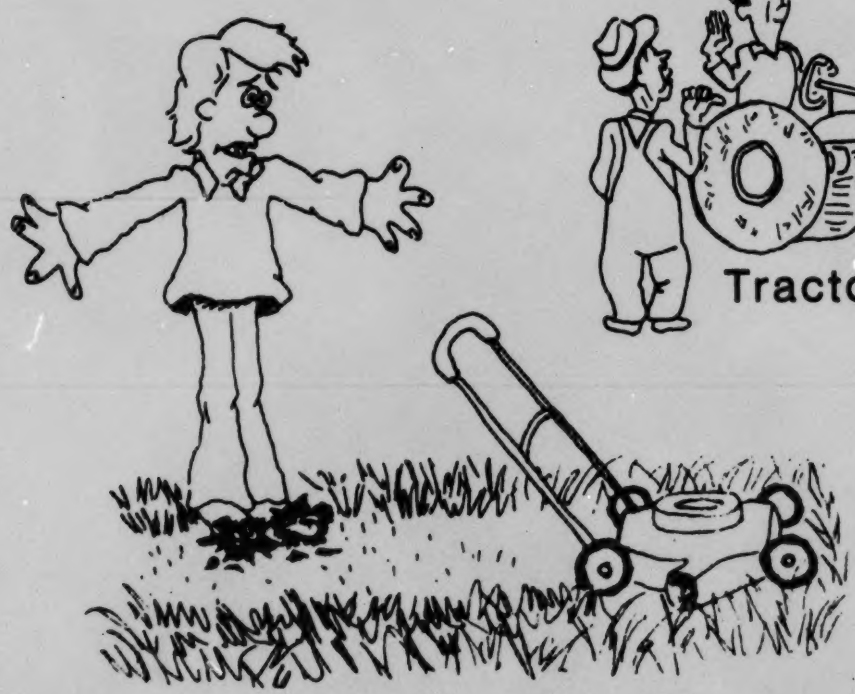
1. NATIONAL CHAPTER AWARD (PROGRAM OF ACTIVITIES)
2. FFA ACHIEVEMENT AWARD
3. PROFICIENCY AWARD
4. SECTIONAL FAIRS AND SHOWS
5. FB-FFA COOPERATIVE ACTIVITIES
6. FB-FFA HERITAGE PROGRAM
7. BOAC
8. CHAPTER SAFETY
9. FOOD FOR AMERICA

CHAPTER SAFETY PROJECTS

Harvest Safety

Chemical Safety

Tractor Safety



Lawnmower Safety

DISCUSSION GUIDE FOR TRANSPARENCIES

I. Transparency - COMPONENTS OF A PROGRAM OF ACTIVITIES

1. Explain to the student what a program of activities is and why it is important.

2. Discuss how a plan is essential to an efficient and effective operation of any kind.

3. Use additional information available in "A Guide for Use in Planning Your FFA Chapter Program of Activities."

II. Transparency - ELEVEN STANDING COMMITTEES OF A GOOD PROGRAM OF ACTIVITIES

1. Discuss each of the eleven areas so that students understand what is involved in each one. The Student Handbook gives suggested activities for each area as does "A Guide for Use in Planning Your FFA Chapter Program of Activities."

III. Transparency - CHAPTER PROGRAM OF ACTIVITIES PLANNING SHEET

1. Use transparency to explain to class the basic format for a program of activities.

2. Ask class members to suggest appropriate information to use in blank spaces. Fill in blank spaces as you explain the format to the class.

IV. Transparency - COMMITTEE ACTIVITY PLANNING SHEET

1. Use an example to show class how to complete this sheet.

2. Explain to class the importance of making written plans for committee work.

V. Transparency - SOME INDIVIDUAL AND CHAPTER AWARD ACTIVITIES

1. Using Student Information Sheet, discuss each activity.

2. Decide which ones will be pursued and how they can fit into the program of activities.

VI. Transparency - CHAPTER SAFETY PROJECTS

1. Review each of the suggested areas for safety projects.

2. Give the class examples of possible projects.

3. Ask class members to identify safety projects which they might carry out.

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

PARTICIPATING IN INDIVIDUAL AND GROUP ACTIVITIES IN YOUTH ORGANIZATIONS

1. True (+) False (0):

   + A. The Program of Activities plan is a worthwhile undertaking for my FFA chapter because it will help us to function more effectively and efficiently.

   + B. It is possible to win a sectional, state and national award for submitting a Program of Activities proposal.

   + C. The Proficiency Awards relate to my S.O.E. project.

   + D. The Achievement Award relates to my S.O.E. project.

   0 E. The FB-FFA Heritage Program and FB-FFA Cooperative Activities Cooperative Activities Program are nationally sponsored.

   + F. BOAC has to do with community development.

   + G. Making safety a part of each unit of agriculture instruction is an objective of the Chapter Safety Award.

   + H. Food for America is an educational program for elementary school children.

   0 I. Sectional fairs and shows are only for FFA members with livestock S.O.E. projects.

2. Answer the following questions:

   A. Identify the major standing committees in your chapter's Program of Activities.

   B. Give examples of activities or responsibilities for three of the above committees.

   C. Give three examples of proficiency awards available in the production group, the non-production group and the placement group. (Nine examples total).

   D. How is the Achievement Award Program related to the Supervised Occupational Experience Program? Include in your answer the four areas of concern in the Achievement Award Program.

3. Do one of the following exercises:

   A. Give an example of a cooperative buying/financing activity you would like to see your club do or at least think about doing.

B. Give an example of an activity you would like to see your chapter do that would qualify for the FB-FFA Heritage program.

C. What is a community problem you think your chapter could do something about as a BOAC project?

D. What is a safety precaution that is normal routine for you but one that you could share with others of less experience? What are the points of safety you would want to cover in telling someone else?

UNIT C: LEADERSHIP IN HORTICULTURE/AGRICULTURE

PROBLEM AREA: DEVELOPING LEADERSHIP SKILLS

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year students in horticulture who have received instruction in the leadership and citizenship problem areas included in Core I. Students should have at least one year of instruction in vocational horticulture and FFA before this material is taught to them. Approximately three days could be devoted to this problem area; however, the instruction would not have to be provided in one block of time. The teacher may wish to discuss the state and national FFA conventions, summer camps and other activities immediately preceding the time when students will be participating in these activities.

Problem areas on public speaking and parliamentary procedure are included in Illinois Core I. Some teachers may not have taught all of these problem areas to freshmen and may prefer to include some instruction in these two areas in the sophomore year. If this is done, this instruction could be scheduled along with this problem area.

Information in Chapter V of the FFA Student Handbook can be used to supplement the material in this problem area.

CREDIT SOURCES:

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The materials included in this problem area were prepared by David Shockey and Paul Hemp and field tested by the Rural and Metropolitan Field Test Teachers. Dr. Joe Townsend, Illinois State University, reviewed the original draft of the field test packet and provided some transparencies, Information Sheets on Conducting Meetings and the Student Worksheet on Committees. Information sheets on "Responsibilities of Committee Members" and "Steps in Planning" were taken from the field test copy of the Illinois Vocational Student, Chapter Officer Handbook, Department of Adult, Vocational and Technical Education, Springfield, Illinois.

TEACHER'S GUIDE

I. Unit: Leadership in Horticulture/Agriculture.

II. Problem area: Developing leadership skills

III. Objectives: At the close of this problem area, the students will be able to:

1. Identify at least 75% of the requirements for each of the four FFA degrees.

2. List a purpose and identify the persons eligible to attend the following: State FFA Convention, National FFA Convention, FFA Leadership Camp, and FFA Leadership Training Schools.

3. Name three types of FFA committees and describe their role and function.

4. Enumerate five FFA activities where leadership can be developed or practiced.

5. List at least six leadership skills and tell why they are important.

6. Participate effectively as a committee member by serving successfully on at least one committee.

IV. Suggested interest approaches:

1. Ask class to name national or state leaders in agriculture/horticulture and FFA.

2. Have class name the traits they think are important in a leader. Use Student Worksheet, "Identify the Leader" to promote interest and discussion.

3. Ask class to react to the following slogans:

   a. "A leader is born, not made."
   b. "He is a natural-born leader."
   c. "The job often makes a leader."

4. Ask class to name leadership positions they have held such as club officer, group leader, person in charge of a work crew.

5. Lead class in a discussion of how many leaders an FFA chapter can have and whether or not all members can be leaders at one time or another.

6. Develop several scenarios where leadership is required, for example, a child drowning at a beach, a person choking in a restaurant, fire breaking out in a crowded auditorium.

V. Anticipated problems and concerns of students:

1. What is a leader? a follower?
2. What traits does a leader have?
3. How can I develop leadership skills?
4. How can I organize my time and my work?
5. How does a leader motivate others?
6. Why should leaders delegate or assign responsibility?
7. Why do some people fail as leaders?
8. What are some FFA programs and activities where we can develop leadership skills?
9. How can I be a successful committee chairperson? a successful committee member?
10. How can I advance in the FFA?
11. What are the degree requirements?
12. How should the FFA jacket be worn?
13. What is the relationship between personal appearance and successful leadership?
14. What makes a successful FFA banquet?
15. What are the purposes of an FFA banquet?
16. What activities can you participate in at the State FFA Convention? at the National FFA Convention?
17. How can one gain poise and confidence in conversation?
18. How can I tell a good story?
19. What is the proper way to introduce people?
20. What are the basic rules of good telephone procedure?

VI. Suggested learning activities and experiences:

1. Have class members establish class goals and personal goals for this problem area.

2. Lead class in an identification of problems and concerns. List on chalkboard or flip chart.

3. Select problems which are covered in available reference material and have students search for solutions.

4. Handout and discuss Information Sheet, "Procedures for Chapter Members." Have students practice the exercise.

5. Distribute Information Sheet on "What is Leadership?" for students to read.

6. Show slide set "FFA Leaders Speak - Leadership" available from the FFA Office in Roanoke.

7. Use Information Sheet, "Procedure for President to Follow," to provide student practice.

8. Use FFA Transparencies on "Degree Requirements" to explain how students can advance in the FFA.

9. Discuss State FFA Convention with class. Use Transparency on "State Convention" to plan for student involvement. Show and discuss VAS Filmstrip 1010, "Behind the Scenes of the Illinois FFA Convention."

10. Show film "Convention Time-FFA" available from Venard Films, LTD, Box 1332, Peoria, IL 61654.

11. Use Transparencies on "National FFA Convention," "Illinois FFA Leadership Camp," and "Leadership Training School" to make chapter plans for these events.

12. Distribute Information Sheet on "Chapter Banquets" and use Transparency on "Chapter Banquets" to discuss and plan FFA banquet.

13. Show class slide set "Planning a Successful FFA Banquet" available from Roanoke office.

14. Use Information Sheets on "Committee Work," "Reporting, Planning and Responsibilities" and the Transparency on "Committee Work" to discuss proper use of committees.

15. Discuss other aspects of leadership development such as grooming, use of the FFA jacket and chapter elections.

16. Have class members complete Student Worksheet on "Committees."

VII. Application procedures:

1. Encourage all eligible students to apply for FFA degrees.

2. Participate in national and state conventions.

3. Encourage students to participate on an FFA Committee.

4. Encourage students to assume leadership roles in other school and community organizations.

5. Sponsor FFA-Parent Banquet.

6. Attend FFA Leadership School and Leadership Camp.

VIII. Evaluation:

1. Prepare pencil and paper test and administer to class at close of problem area.

2. Develop point system to give students credit for leadership activities.

3. Observe changes in leadership roles assumed by class members.

IX. References and aids:

1. Official FFA Manual

2. FFA Student Handbook from Production Credit Association, Chapter IV.

3. Slide sets from State FFA Office, Roanoke, IL:

   "Planning a Successful FFA Banquet"

   "FFA Leaders Speak - Leadership"

4. Film Entitled "Convention Time - FFA" available from Venard Films, Peoria, IL.

5. VAS Transparencies on "FFA Leadership," 1-10.

6. Information Sheets included with this problem area are as follows:

   a. "Do You Just Belong?"
   b. "Greenhand Degree Requirements"
   c. "Application for Chapter Degree"
   d. "State FFA Degree Requirements"
   e. "Rules for Wearing the Official FFA Jacket"
   f. "Chapter Banquets"

g. "Committee Work"
h. "Steps in Planning"
i. "Responsibilities of Each Committee Member"
j. "Committee Meeting Reports"
k. "Officer Application"
l. "What is Leadership?"

7. Student Worksheet on "Committees"

INFORMATION SHEET

DO YOU JUST BELONG?

Are you an active member,
The kind that would be missed?
Or are you just contented
That your name is on the list?

Do you attend the meetings,
And mingle with the flock?
Or do you stay at home
And criticize and knock?

Do you ever go to visit
A member who is sick?
Or leave the work to just a few
And talk about the clique?

There's quite a problem scheduled
That I'm sure you've heard about,
And we will all appreciate it
If you'll come and help us out.

So come to the meeting often
And help with hand and heart;
Don't just be a member,
Dig in, and do your part.

Think this over, will you?
You know right from wrong;
Are you an active member
Or do you just belong?

Author Unknown

INFORMATION SHEET

GREENHAND DEGREE REQUIREMENTS

ARE YOU -

1. Enrolled in a vocational agriculture course?

2. Familiar with the purposes of FFA?

3. Familiar with the FFA program of activities?

DO YOU -

1. Have a satisfactory supervised occupational experience program planned for this year?

2. Know the proper use of the FFA jacket?

3. Know the FFA code of ethics?

4. Have access to an FFA Manual?

5. Have a written application prepared?

CAN YOU -

1. Recite and explain the FFA motto, creed and salute?

2. Identify the parts of the FFA emblem?

3. Identify the historical highlights of the FFA?

INFORMATION SHEET*

APPLICATION FOR CHAPTER DEGREE

(To be completed by the candidate applying for the degree and submitted to the chairperson of the degree committee)

		Answer "Yes" or "No"
1.	Have you satisfactorily completed at least one semester of instruction in vocational agriculture?	_____
2.	Do you hold the Greenhand degree?	_____
3.	Are you familiar with the purposes and program of activities of your chapter?	_____
4.	Are you familiar with the chapter constitution?	_____
5.	Are you familiar with at least five parliamentary procedure abilities?	_____
6.	Have you led a group discussion for at least 15 minutes?	_____
7.	Have you earned at least $50 from your supervised agricultural experience program?	_____
8.	Have you actively participated in chapter activities?	_____
9.	Have you paid your dues for the current year?	_____
10.	Are you now enrolled in a vocational agriculture class?	_____
11.	Do you now have a satisfactory supervised agricultural experience program? Describe briefly your program.	_____

_____

_____

_____

Score on Chapter FFA Test _____

Scholastic average in all subjects _____

*Adapted from the FFA Advisor's Handbook published by the National FFA Center.

Date: _____, 19__ Signed: _____
Candidate

Approved by the Degree Committee: _____, Chairperson

_____, Advisor

Degree conferred on _____, 19___

(To be placed in member's file)

INFORMATION SHEET

STATE FFA DEGREE REQUIREMENTS

DO YOU -

1. Have the Chapter Farmer (FFA) Degree?

2. Have at least two years of FFA membership?

3. Meet FFA scholastic requirements?

   a. Top 40% of your class or,

   b. A grade point average of 85%.

   c. 3.5 on a 5 point scale or 2.5 on a 4 point scale.

HAVE YOU -

1. Earned and invested $750 or worked at least 750 hours in an S.O.E.P.

2. Helped plan and carry out the Program of Activities?

3. Participated in five (5) FFA activities above the chapter level?

CAN YOU -

1. Demonstrate leadership ability?

2. Meet other requirements of Illinois FFA?

INFORMATION SHEET*

RULES FOR WEARING THE OFFICIAL FFA JACKET

1. The jacket should be worn for all FFA events and during State and National FFA Week.

2. When worn on official occasions, the zipper should be fastened to the top, the collar turned down, and the cuffs in place and buttoned.

3. The member represents the organization when wearing the jacket. His/her conduct will reflect on the organization. A member should not smoke in public while wearing the FFA jacket or conduct him/herself in any way that will discredit the FFA and the school.

4. The emblems should be removed if membership in the FFA is discontinued.

5. Only the owner of the jacet should wear it. Members should not allow friends to use the jacket if worn in public, except when a student not owning a jacket is in need of a jacket while representing the chapter.

6. The jacket should be clean when worn in public.

7. Only the FFA pins representing the member's present degree, the highest office held and highest award earned, should be worn on the left side above the name. No other jewelry, school letters or insignia of other organizations should be attached to or worn on the jacket.

I_____ do hereby agree to wear my official FFA jacket in accordance with the above provisions.

Witnessed

_____
Chapter President

_____
Chapter Secretary

Date _____

Signed _____

* Taken from the FFA Advisor's Handbook published by the National FFA Center.

INFORMATION SHEET*

CHAPTER BANQUETS

DO...

- Use opening and closing ceremonies.
- Invite a local editor, and radio and TV representatives.
- Invite people who have made outstanding contributions to vocational horticulture and the FFA.
- Order banquet supplies 8-10 weeks before the banquet from the FFA Supply Service. FFA Foundation awards, which are provided free to the chapter, including the "Award Certificate" should be obtained from the State FFA Office in Roanoke, Illinois.
- Use RSVP invitations but do not try to use placecards except for the head table.
- Have ushers who are properly instructed. Always fill up the tables directly in front of the head table first. If there are to be empty chairs, don't advertise them by having them right in front of the speaker's rostrum.
- Hold the time to a maximum of two and one half hours start to finish.
- Use FFA placemats and, if possible, the colorful FFA paper cups, etc. that can be ordered from the FFA Supply Service. Set up displays featuring horticulture and FFA projects.

DON'T...

- Have members introduce their parents individually unless it is a very small banquet in a room with excellent acoustics. It is time consuming, and nobody can hear what is being said.
- Use poorly prepared programs. If you cannot get a good, neat job of duplicating, you are better off without any programs at all.
- Take the banquet as an opportunity for the advisor to be on display. You should turn the show over to the members and keep your activities to a minimum.
- Show films or slides at the banquet unless facilities are such that everyone can both see and hear.
- Initiate Greenhands or Chapter Degree recipients at the banquet. One initiation ceremony, the Honorary Chapter degree, is enough.
- Allow "dead" spots that seem to drag on forever. If you have an FFA band or accordionist, have this portion of the program while the tables are being cleared.
- Introduce guests without a prepared list. If you miss somebody, they are not likely to be amused.

DO...

DON'T...

- Have a master of ceremonies try to be funny. Leave that to the professionals. Nine times out of ten the stories fit one of the two categories: (a) they aren't funny (b) they are in poor taste.

- Seat people so that they have their backs to the head table.

- Assign special speaking roles to chapter officers. They already are on the program. Distribute the responsibility. Is there any special reason why the President has to be the master of ceremonies?

- Have those with speaking roles sitting far away from the rostrum.

INFORMATION SHEET

COMMITTEE WORK

Three types of committees are:

1. Executive Committees
2. Standing Committees
3. Special (ad hoc) Committees

The executive committee is usually composed of the officers and, in some cases, chairpersons of the standing committees. The executive committee should provide leadership for the chapter but should not control the group or dominate it. It should lead, not dictate. The executive committee should meet a week prior to each chapter meeting to plan the agenda and to prepare for a successful meeting.

Each FFA chapter should have at least eleven standing committees. These committees correspond with the eleven major sections of the FFA program of activities. The Vice-President is in charge of the program of activities, and for this reason, works closely with the eleven standing committees. All chapter members should be on at least one standing committee. Members should be asked to state their preferences and final selecton should be made by the committee chairperson and the executive committee. Each committee should include members from various grade levels; however, when arranging meeting times is a serious problem, the chapter may decide to have all members of a particular committee selected from one class. Chapter officers should not serve as chairpersons of standing committees and thereby deprive other members of an opportunity to develop leadership skills.

Special committees are formed to handle projects not reserved for the executive or standing committees. An ad hoc committee is a temporary committee appointed to accomplish a specific task and then dismissed. Most special committees are of the ad hoc type. Members are usually selected and appointed by the chairpersons who should consider volunteers in making the selections.

Active and useful committee work usually depends on strong leaders serving as chairpersons and members who are motivated to accomplish committee goals. Committees should report their recommendations and accomplishments to the total membership at chapter meetings.

INFORMATION SHEET

STEPS IN PLANNING

Brainstorm to identify concerns and issues related to:

- individual
- job/career
- family
- community
- school
- state
- chapter
- nation

Narrow identified concerns and issues by exploring resources that can help to solve the problem under discussion.

Determine the goals of the project.

Decide what needs to be done and when.

Form a plan for carrying out the activities.

Act on the plan.

Analyze what happened.

INFORMATION SHEET

RESPONSIBILITIES OF EACH COMMITTEE MEMBER

Some of the most burdensome conflicts of this world as well as your chapter could be solved, or eliminated, if groups would exercise group leadership responsibilities through cooperative thinking. You, as a vocational student organization officer, can promote the leadership qualities of each chapter member. Members reponsibilities are to:

1. Participate in group discussion at every opportunity.
2. Take responsibility for the progress of the group toward a workable solution.
3. Follow good thinking habits.
4. Speak loudly enough for all to hear.
5. Be willing for others to disagree with issues you raise.
6. Help others to drop an argument for the sake of moving ahead with "bigger" issues.
7. Be an alert listener while awaiting your turn to participate.
8. Help others to make their point clear and bring valuable experiences that you have had into the discussion.
9. Assume an attitude of conversation in solving group problems.
10. Help the leader by participation that keeps on the subject.
11. Help reduce the "load" of a group leader by forwarding your ideas--be a leader in the group.
12. Become more skillful as a group member--evaluate your contribution to the group.
13. Use parliamentary skills to help the group leader move to successful group action.
14. Be ready to shoulder your share of the group's responsibilities.

INFORMATION SHEET*

COMMITTEE MEETING REPORTS

Date _____

Report from _____ Committee

Committee members present: _____

_____

Absent: _____

Purpose of meeting: _____

_____

_____

_____

_____

Action to be taken: Member(s) responsible:

_____

_____

_____

_____

_____

Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Chairperson

* Taken from the FFA Advisor's Handbook published by the National FFA Center.

M-II-C-2-20

INFORMATION SHEET*
OFFICER APPLICATION

Chapter application for the office of _____

Name _____ Age _____ Year in Ag or Hort ___

Degree held at present: (State Degree, Chapter Degree, Greenhand Degree)

Leadership activities in FFA:

Judging team experience:

Leadership and participation in school and other activities:

Are you willing to accept another office? Yes___ No___
If so, which (In order of preference)

Supervised farming and/or agricultural experience program:
Present year program Scope

Program last year Scope

What have you done to improve the FFA?

What do you feel you can do to improve the FFA?

Average grade for current school year: _____

Average grade in vocational horticulture: (by years) ____, ____, ____

Why are you running for an office of the _____ Chapter?

Number of meeting attended since last June 1st: _____

Are you willing to spend extra time on parliamentary procedure? _____

Are you willing to spend extra time in planning and conducting chapter meetings and activities? _____

- -

Approval of parent or guardian

_____ has our complete approval and our encouragement in his/her quest for a chapter office and we fully realize the additional time and work required of an office of the FFA if he/she is to fulfill his/her responsibilities properly.

_____
Parent's or guardian's signature

*Taken from the FFA Advisor's Handbook published by the National FFA Center.

INFORMATION SHEET

WHAT IS LEADERSHIP?

Have you ever asked yourself this question? If so, what did you find for an answer, or who did you think of as an example of leadership.

Thinking about leadership is important because it is an essential aspect of our daily lives. A few people are leaders in everything they do; far too many people are never leaders in anything they do because they fail to learn of their own leadership potential. Before anyone can understand what kind of leader they can be, they must understand what leadership is, and what it is not.

IS IT A TRAIT?

Have you ever thought to yourself "That is the kind of leader I want to be," after meeting a person who was obviously a leader?

This is the Great Man/Great Woman approach to leadership. You simply pick the leader in your life whom you most want to be like, and you study the traits they have, the activities he/she has participated in, talk and act like they do, and have friends like he/she has made and kept. Then, you will be exactly the leader you want to be.

This approach may work for a few people - a very few! The problem that develops in the Great Man/Great Woman approach to leadership is that no two leaders (just like no two people) are exactly alike. A scenario of leadership that worked for one person can just as easily fail for you.

Discouraged students of the Great Man/Great Woman leadership school think that they have no leadership potential. They think leaders are born not made -- discovered not trained. In other words, unless you truly are like the leader you want to be like - don't try to be.

IS IT THE POSITION?

Another school of thought is that leadership is found in the position you hold. Thus, presidents of organizations and chairpersons of committees should always be leaders. But are they?

In business for example, a person is often chosen to head a company or a project because of his/her expertise and experience. That does not always mean that the person is a leader.

For those people (admittedly the majority) who hold positions of leadership and who are, in fact, leaders, which came first: the position or leadership? Think about it. Have you ever voted for a person to be an officer of an organization so that he/she could become a good leader? Maybe, you have -- and maybe that person did become a leader. More often than not, however, the position is achieved by the person holding it because they had some leadership potential.

This is not to say that you will not become a better leader by holding a position that exercises your leadership skills. In fact, that is some of the best leadership training you can have.

Like the chicken and the egg, with a position and your leadership, it is difficult to know which can or must come first.

IS IT STYLE?

Some people think that anyone can be a leader who acts like a leader. This is the style approach to leadership. The secret to this approach is matching your style to that of the group you want to lead. If you have a group made up of members who don't care who leads as long as they don't have to - you can be an Autocratic Leader. Autocrats make all of the decisions, do most of the work and get all of the complaints and congratulations (if there are any). If you have a group of interested and involved people who want to have a part in the decision-making process, you need to be a Democratic Leader. Democratic Leaders keep their group on course, keep members working together, and help the group lead itself.

If you have a group that is extremely well organized into sub-groups which make all of the decisions and do all of the work - you can be a Laissez-faire Leader. Laissez-faire does not mean lazy, but merely "laid back" or casual in the approach to leadership. Actually, a Laissez-faire Leader may do well in various types of groups or positions - if that is the popular style of leadership.

As these styles and hypothetical groups suggest, the type of style depends upon what is needed or wanted from those who chose a leader. Sometimes the basis of that decision is not just style, but the skills that accompany it.

IS IT SKILL?

Students of leadership who don't have success in the Trait, Position or Style approaches may find leadership in the Skill approach. This approach assumes that leadership is a learned set of skills which anyone with certain minimum requirements can acquire. In short, by acquiring leadership skills you can be a leader regardless of your traits, your position, or your style.

Once you have a skill (or several of them) you are qualified for leadership in any group with a task to utilize that skill. Like fitting pieces of a puzzle into place, you can perform certain functions for certain groups and in certain positions that match your leadership skills. This assumes, of course, that you are willing to improve the skills you have and expand upon the number of them.

To begin with, you need to identify the leadership skills, or potential skills, you have. Ask a friend who knows you well and who has worked with you on several projects or in several organizations what skill he/she thinks you have. Do you persuade people to your point of view? Do you motivate others to work harder? Are you well-organized? Are you an

effective communicator in speech and writing? These are questions that require objective and honest answers from you and the people you work with.

The next step is for you to decide what leadership skills are important. This is something like the Trait approach in that there are many common skills that effective leaders possess. Not yet an expert in leadership, you may not be able to adequately decide what skills are important. To do so requires study and practice.

Studying leadership skills can be done by reading, attending leadership training activities, and keeping track of your own impressions of what skill is needed in a particular task or position of leadership.

Practice is gained by using the skills you have in an effort to improve them. Participating in speech contests or committee work, running for a position that you think will utilize your skills, and asking yourself why you won or lost in each attempt is the most valuable practice you can have.

Although there has never been a fully-skilled leader or a complete list of leadership skills, here is an suggested list for your reference:

1. Ability to organize
2. Ability to communicate (speaking & writing)
3. Ability to motivate others
4. Ability to manage time effectively
5. Ability to see the group's true objective
6. Ability to stay informed
7. Willingness to listen
8. Willingness to delegate authority (when appropriate)

Let's consider each of these leadership skills and think about how they can be developed and used.

1. <u>Ability to Organize</u>

If you have ever wondered what you should do next, where the notes from your last committee meeting were, or who you asked to help you with a certain project, perhaps you know what it is to be a little un-organized.

There is no set formula for "how to organize." It is more important how you approach each individual project or activity. If you spend a little time after each activity summarizing in your mind--or briefly on paper--what happened and what needs to be done next, you have taken the first step. Next, you should attempt to put all of your commitments into perspective. Which of the "needs to be done" has top priority?

Efficiency is another element of organization. It is not enough that you know what is most important to do, but that you do it with the least confusion and complication possible.

2. Ability to Communicate

No leadership skill receives as much practice as communication. Yet, most people have significant room for improvement in the effectiveness of their communicative skills--speaking and writing.

The old adage that communication is a two-way process is very true. Effective speakers and writers are usually also good readers and listeners. The more time and effort devoted to the thoughts of others the better able you will be to communicate your own thoughts.

Public speaking is sometimes thought to be an exception to the two-way communication process merely because there is little verbal response from audiences. It is important to remember that public speakers spend only a fraction of their time at the podium, relying on the same interaction as anyone else the rest of the time to keep their speeches current and effective.

Writing skills can also be improved with a little practice. In writing, there is the advantage of being able to see your thoughts and words before anyone else does--unlike speaking where a slip of the tongue is heard by all. To make the most of this quality of writing, you should prepare several drafts of what you are trying to write and then adopt the one that says it most effectively. Obviously, time does not always permit you to make this effort. When it does, however, the practice will be more valuable than our usual method of practicing communication, such as talking to a friend.

3. Ability to Motivate Others

Countless books have been written on this leadership skill. Many of them are worth reading and a good librarian or bookstore should be able to provide you with them, if you are interested.

What many of these books have in common is the subject of attitude and its effect upon your ability to motivate others.

Think for a moment about an occasion when you were able to get people excited about joining in some activity--and then think of an occasion when that excitement of your followers seemed to be lacking. What was your attitude on each occasion? Were you exhibiting the attitude that the others showed?

Depending on the personalities involved, motivation can be seemingly easy or nearly impossible. Like other skills, it requires practice and a positive attitude.

4. Ability to Manage Time Effectively:

Effective leadership is synonymous with getting things done. To get things done requires the efficient use of one of life's most precious commodities - TIME.

Time management experts advocate the use of lists and prioritizing to get control of your time. They suggest starting off each day with a list of the things that you want to accomplish that day, with each item being coded with an "A," "B" or "C" priority. If items arise in the course of the day that you did not anticipate on your list, you cut "C" priorities first. Always try to get your "A" priority items done each day.

In reality, few people can follow such a list each day. The logical approach to time management can be used in the less-formal mental lists and priorities that we can keep.

5. Ability to See the Group's Objective

What are your goals? What are your objectives? Where is your group headed? These are common questions for leaders to ask. The real test of leadership is finding some answers.

In the case of a group, it often happens that short-term accomplishments distort the view of long-term objectives. For example, it is easy to sponsor three separate and successful fund raising activities and still fall short of the total budget objective. No one is more responsible for keeping an eye on the objectives of a group than its leader.

The same skill is important in personal leadership as well. If your objective is the American Farmer Degree, you can't ignore essential efforts to obtain your Chapter degree and State FFA degrees.

6. Ability to Stay Informed

An important ingredient to leadership is knowledge. This does not mean that only the brilliant can lead, however.

The most useful kind of knowledge for the purpose of leadership is that obtained in the kind of two-way communication discussed above. By good listening, reading and thinking required for effective communications, a leader can also stay well informed.

We live in an age of information overload. This means that there is literally more information than any one person can assimilate effectively on most subjects. In order to be well-informed, then, a leader must be selective about the information he/she seeks.

As a student, you should be able to appreciate the selective learning process. Just be aware that in leadership positions that same skill will be required. You will not be graduated from the necessity to be informed as long as you are a leader.

7. Willingness to Listen

As already discussed in regard to effective communication, listening is definitely a leadership skill.

Aside from the communicative and informational benefits, listening has advantages for the people who are listened to. By your willingness to listen, they have a part in your leadership decisions. This will not always be a positive impact, to be sure. Nonetheless, the input gained from listening can make leadership a more democratic process, and usually a more informed process, as well.

Since persuasion is oftentimes the task of a leader, you should also realize that listening can give added efficiency to your persuasive ability. Quite simply, the more you listen, the less you may have to say.

8. Willingness to Delegate Authority

As noted under the discussion of Leadership Styles, there are Autocratic Leaders and there are Democratic Leaders, with many varieties in between. One of the characteristics that distinguishes these styles is the willingness to delegate authority.

Depending on the leadership position you hold, there may be real advantages to delegating some of your authority. Chairpersons of committees, for example, can delegate most of the real work of the committee and thereby spend more time on the coordination of that work and the planning for future projects.

There are times when delegation is not appropriate, of course. If you are elected chapter president, you should not delegate all of your responsibilities to the greenhands of the chapter, for instance.

Realizing when and to what extent to delegate authority is one of the marks of a person who is well-trained in this particular leadership skill.

LEADERSHIP AND THE FFA

As an FFA member, it may already have occurred to you that few organizations talk about, meet about, or have as much to do about leadership as FFA. From the National FFA Convention to the Greenhand Degree - all of the FFA's leadership development programs and activities are provided to help you develop your leadership skills.

INFORMATION SHEET

SUGGESTED MEETING PROCEDURES FOR CHAPTER MEMBERS

Secretary: When the President calls for the minutes, stand up and read the following:

Minutes of a regular meeting of the _____ FFA Chapter _____, Illinois. September 10, 19__. The meeting was called to order at 8:00 p.m. by the president, _____. Thirty-four members were present. The minutes of the previous meeting were read and approved. The treasurer reported:

Balance on hand August 10, 19__	$300
Total receipts - dues received.	50
Disbursements - FFA manuals	30
Balance on hand, September 10, 19__	$320

Leo Martin, chairperson of the recreation committee, reported that a hay ride had been planned for the next meeting. A film on gun safety was shown. Keith Smith reported that the refreshment stand discussed last meeting will be built near the football field. John Towns reported that the flowers were sent to Mrs. Olsen in the hospital. He also added that she should be out of the hospital by next week. Susan Anthony moved to purchase a pick-up truck for chapter use. Tom Jones seconded the motion. After much discussion, the motion was voted down. The meeting was adjourned at 9:00 p.m. After the meeting, members played volleyball.

Treasurer's Report: When the President asks for officer reports stand and say: Mr./Madam President. (Pause)

- Balance on hand September 10, 19__	$320
- Total receipts - 20 dues	100
- Disbursements	20
- Balance on hand, October__, 19__	$400

Special Feature Volunteer: After the President asks for a volunteer to present Creed - rise and recite or read the FFA Creed.

New Business Item: When the President says "The floor is now open for any new business which should be discussed," stand and say "Mr/Madam President" (Pause). Then say, "I am worried about the costs to our members going to the National FFA Convention in Kansas City next month; therefore, I move that our chapter pay for the motel rooms for our chapter representatives at the National Convention." Then sit down.

Conduct of Meetings Chairperson: When the President asks for program of activity reports say:

"Mr/Madam President. (Pause) The Conduct of Meetings Committee met and has arranged for Dr. Baker, an area veterinarian, to present a program for our next meeting. He will be discussing animal health practices which should be beneficial to members with livestock."

Food for America Chairperson: When the President calls for any Special reports, rise and after President recognizes you say:

"The Food for America project will begin next Monday. If you have not signed up for the project and would like to, see me after the meeting."

Persons to second motion: After a motion has been made, the President will ask for a second. You say: "Mr/Madam President, I second the motion."

INFORMATION SHEET
STEP-BY-STEP PROCEDURE FOR PRESIDENT TO FOLLOW

1. Stand and tap the gavel two times.

2. Read the President's part in the opening ceremonies. (Refer to official FFA Manual.) Complete opening ceremony.

3. Ask: "Will the Secretary please read the minutes of our last meeting?"

4. After the Secretary reads the minutes, say: "Thank you. Are there any additions or corrections? (Pause) Seeing none they stand approved as read." (Tap gavel once.)

5. State: "We will now have officer reports. Does any officer have a report to make at this time?" (Treasurer will rise and seek recognition. You recognize Treasurer by calling her/his name.)

6. Following Treasurer's report you ask: "Are there other officers who wish to report at this time? (Pause) If not, the chair will now receive reports from any program of activity committees." (Chairperson of the Conduct of Meetings Committee will seek recognition. Recognize student by calling her/his name.)

7. Following the report, say: "Thank you. Do we have other program of activity reports? (Pause) If not, we will now have a volunteer recite the FFA Creed as a special feature of this meeting. Do we have a volunteer?" (Recognize student who stands by calling her/his name.)

8. Following the presentation, say: "Thank you. (Pause) Do we have any unfinished business which should be discussed at this time?" (Pause) Seeing none, we will proceed to special committee reports. "Do we have any special committees who would like to give a report of their activities?" (Recognize Chairperson of the Food for America Committee by calling her/his name.)

9. Following report, say: "Thank you. I'm sure our chapter will gain much from this activity. (Pause) Are there other reports? (Pause) If not, the floor is now open for any new business which should be discussed." (Recognize student who rises. The students will voice a concern and will move that the chapter pay for the room for our chapter representatives at the National Convention.)

10. You ask: "Do I hear a second to the motion?" (Pause) "The motion to pay our chapter representatives' rooms at the National Convention has been properly moved and seconded. Is there any discussion? (Pause) If not, all those in favor of the motion, raise your right hand. (Pause while you count hands) Opposed, same sign. (Count hands - then announce vote.) The motion passes (or fails)." (Tap gavel once.)

11. Read the President's part in the closing ceremonies. (Page 47 and 48 in the Student Handbook.) Complete closing ceremony.

STUDENT WORKSHEET

IDENTIFY THE LEADER

Directions: Draw a line from the famous quotation on the left to its occurrence in history on the right.

"Four score and seven years ago..."	Martin Luther King used this phrase to promote civil rights.
"Give me liberty or give me death!"	This quotation of Patrick Henry became a slogan of Americans' determination to win their independence from England.
"Ask not what your country can do for you, ask what you can do for your country!"	President Franklin Roosevelt spoke to the American citizens during his inaugural address to instill confidence to endure the Great Depression.
"One small step for man, one giant leap for Mankind"	During his inaugural address, John F. Kennedy set the tone for the 1960's--The New Frontier.
"You have nothing to fear but fear itself"	After landing on the moon, Neil Armstrong summed up the feeling of achievement for all those connected with the space project.
"I have a dream. . . . . ."	This Civil War speech of Abraham Lincoln boosted the morale of the Union troops and became a symbol of the war.

Can you think of any other quotations where WORDS became an important part of history?

Quotation	Event
_____	_____
_____	_____

WORDS ARE POWERFUL--LEADERS SHOULD DEVELOP THE ABILITY TO USE THEM EFFECTIVELY!!

When the chairperson doesn't know what is being done on any of the major tasks of the committee.

When the committee has never had a meeting.

When two different members of a committee come to the chapter advisor at different times and have completely opposite views of what the committee decided to do on a project.

Remind the members that this isn't comical--but a serious indication of committees gone astray.

STUDENT WORKSHEET

COMMITTEES

I. Match the committee with the purpose.

	Committee		Purpose
___	1. Supervised Occupational Experience	A.	Helps chapter publicize activities.
___	2. Cooperation	B.	Encourages members to have fun.
___	3. Community Service	C.	Helps members work with FFA supporters.
___	4. Leadership	D.	Actions benefit community.
___	5. Earning, Savings, & Investments	E.	Help members with their S.O.E. programs.
___	6. Conduct of Meetings	F.	Encourages members to apply for FFA Awards
___	7. Scholarship	G.	Arranges for special meetings.
___	8. Recreation	H.	Works with other organizations.
___	9. Public Relations	I.	Helps chapter secure funds.
___	10. State & National Activities	J.	Encourages members to improve grades.
___	11. Alumni Relations	K.	Provides opportunities to practice leadership.

II. Circle the numbers of the standing committees listed above that our chapter has.

III. List any additional committees our chapter has.

1.

2.

3.

IV.

TEACHER'S KEY

STUDENT WORKSHEET

COMMITTEES

I. Match the committee with the purpose.

	Committee	Purpose
E	1. Supervised Occupational Experience	A. Helps chapter publicize activities.
H	2. Cooperation	B. Encourages members to have fun.
D	3. Community Service	C. Helps members work with FFA supporters.
K	4. Leadership	D. Actions benefit community.
I	5. Earning, Savings, & Investments	E. Help members with their S.O.E. programs.
G	6. Conduct of Meetings	F. Encourages members to apply for FFA Awards
J	7. Scholarship	G. Arranges for special meetings.
B	8. Recreation	H. Works with other organizations.
A	9. Public Relations	I. Helps chapter secure funds.
F	10. State & National Activities	J. Encourages members to improve grades.
C	11. Alumni Relations	K. Provides opportunities to practice leadership.

II. Circle the numbers of the standing committees listed above that our chapter has.

III. List any additional committees our chapter has.

1.

2.

3.

IV.

FFA Greenhand Degree

1. Awarded by local chapter
   as the first level of membership

2. Qualifications for the Greenhand Degree

Be enrolled in
Vocational Agriculture

Be familiar with the aims, purposes, and history of the FFA

Be able to explain the FFA Creed

Receive a majority vote

from the

local chapter members

3. Start planning now

for an active year.

Requirements for Chapter FFA Degree

1. Must have received The Greenhand Degree.

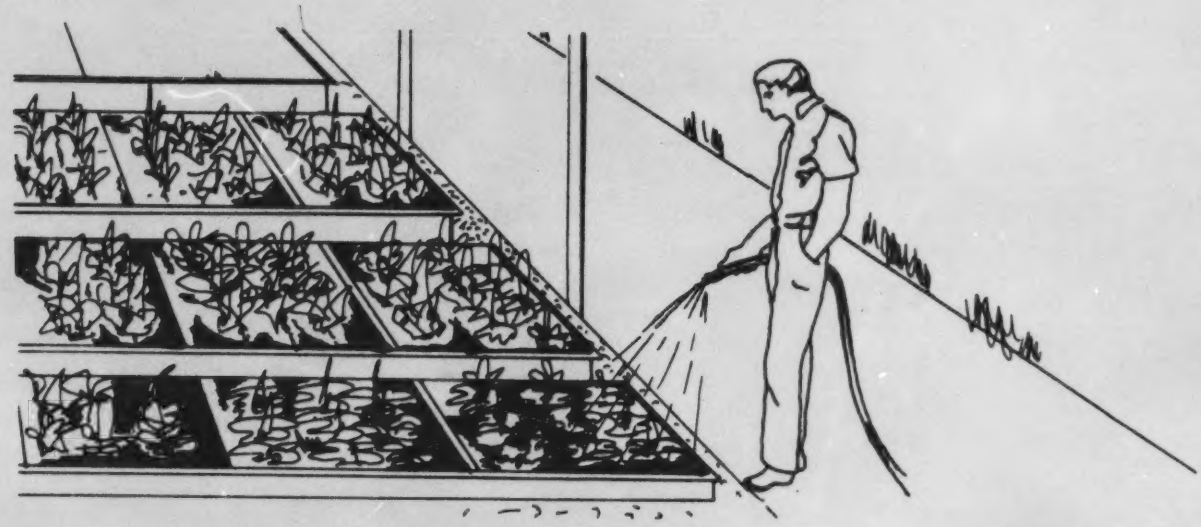
2. Successfully completed at least one semester of vocational horticulture

3. Have an appropriate supervised occupational experience program .

4. Be currently enrolled in a vocational horticulture course.

5. Have an understanding of the local constitution and program of activities.

6. Have participated in at least three local FFA activities.



7. Have earned $50 from your supervised occupational experience program or worked a minimum of 50 hours as shown in your SOEP record book.

8. Be able to lead a group discussion for at least 15 minutes.

9. Demonstrate a knowledge and ability to use at least 5 parliamentary procedure skills.

10. Have made acceptable progress toward a Proficiency Award at the local level

11. Must currently have a passing grade in horticulture.

12. Make an application for the Chapter FFA Degree and receive approval of a majority of the chapter members.

STATE FFA DEGREE REQUIREMENTS

1. Have the Chapter Farmer (FFA) Degree and have been an active member for at least two years.

2. Completed two years of vocational agriculture.

3. Have earned and productively invested at least $750 from your S.O.E.P. or worked 750 hours in a laboratory experience program.

4. Demonstrate the leadership ability by the following:

    a. Perform 10 parliamentary procedure skills.

    b. Give a five minute speech.

    c. Serve as an officer, committee chairperson, or member of a major FFA committee.

5. Have a satisfactory scholastic record.

6. Participate in the planning and completion of chapter program of activities.

7. Participate in five FFA activities above the chapter level.

8. Meet other requirements identified by your advisor.

AMERICAN FARMER DEGREE REQUIREMENTS

1. Have the State FFA Degree and have been active for at least three years.

2. Must be at least one year out of high school and have an outstanding S.O.E.P.

3. Must have earned and invested at least $5000 in an S.O.E.P.

4. Must document participation in leadership activities from local to state levels and have a satisfactory high school record.

5. Illinois nominates American Farmer and Agribusiness Degree candidates each year.

STATE FFA CONVENTION

WHAT?

WHEN?

WHERE?

WHO ATTENDS?

WHAT HAPPENS?

WHAT DELEGATES SHOULD DO WHEN THEY RETURN HOME.

NATIONAL FFA CONVENTION

WHAT?

WHEN?

WHERE?

WHO ATTENDS?

WHAT HAPPENS?

ILLINOIS FFA LEADERSHIP CAMP

1. Started in 1975 by the FFA Alumni Association
2. Held each July or August for one week.
3. Chapter officers from every FFA Chapter are eligible.
4. Leadership staff includes:
   - Past state & national FFA officers
   - Current state & sectional officers
   - A Farmland Industries Leadership Intern
5. Program of events includes:
   - Group workshops on FFA programs and activities
   - Group projects
   - Professional speakers and entertainments
   - A camp banquet
   - Recreation time each day

LEADERSHIP TRAINING SCHOOLS

WHEN? Held anually in the fall.

WHERE? In each section.

WHO ATTENDS? Chapter Officers, Greenhands, Section Officers and Advisors.

WHAT ARE THE PURPOSES?

- to provide officer training
- to conduct a section business meeting
- to meet and learn from fellow business officers
- to meet the State FFA Officers

FFA CHAPTER BANQUET

1. WHEN IS IT HELD?
2. WHERE IS IT HELD?
3. WHO ATTENDS?
4. WHAT IS THE PROGRAM?
5. WHO IS RECOGNIZED?
6. HOW TO ORGANIZE?
7. WHEN TO ORGANIZE?
8. IS IT WORTH IT?

FFA COMMITTEE WORK

HUMOROUS DEFINITION:

A committee has been called – A group of the unprepared, appointed by the unwilling, to do the unnecessary.

Do you agree?

IMPORTANT COMMITTEE INFORMATION:

1. When to have a committee?
2. Who serves on committee?
3. Who leads a committee?
4. Who appoints committees?
5. How should a committee work?
6. When is a committee not working?

TRANSPARENCY DISCUSSION GUIDE - FFA DEGREE REQUIREMENTS

Transparencies on FFA Greenhand Degree

1. Explain each of the requirements on the transparencies.

2. Be honest with students on how strict you are in use of these requirements for giving the degree in your chapter.

3. If you have other requirements for the Greenhand Degree, explain them.

Transparencies on Requirements for Chapter FFA Degree

1. Again, answer any and all questions about the official requirements.

2. Discuss other particular requirements you have for this degree.

3. Note the degree title and how it can be adapted for non-farm students.

Transparency on State FFA Degree Requirements

1. Give details of how you choose the chapter's candidates for the State FFA degree -
   - a local committee
   - record book quality
   - seniority
   - other

2. Explain which of the Illinois FFA's academic requirements specifically apply to your school.

3. Explain how State FFA Degree candidates are interviewed and ranked.

4. Answer questions on other official requirements.

Transparency on American Farmer Degree Requirements

1. Explain the usual procedure for assisting American Farmer Degree candidates with records and project development beyond high school.

2. Impress upon the members the benefits of starting work toward the American Farmer Degree early (Sophomore or Junior year of high school).

Transparency on State FFA Convention

1. Go through the "What, When, Where, and Who Attends" information. Add any thoughts that you have on the convention's location, or reasons for the time of the convention.

WHAT: Illinois FFA Convention

WHEN: Second Week of June each year

WHERE: Assembly Hall, University of Illinois at Champaign-Urbana

WHO ATTENDS: FFA Members, Parents, Advisors, Alumni, and Guests
Average attendance is 2000 - 3000

2. WHAT HAPPENS:

a. Chapter Award Winners are recognized.
b. State FFA and Honorary FFA degrees are conferred.
c. Foundation Proficiency Awards are presented.
d. State Association Business is conducted.
e. State FFA Chorus and Band perform.
f. Professional speakers and entertainers perform.
g. State FFA officers give retiring addresses.
h. New State FFA Officers are elected.

3. DISCUSS OR EXPLAIN THE FOLLOWING:

a. Offer some sample programs from past conventions to the class.

b. Mention the Chapter Awards presented:

- Heritage - Cooperative Activities - Chapter Safety -Bankers Plaque for Program of Activities

Tell which of these awards your chapter has been in competition for in the recent past.

c. Go into some detail on the Foundation Proficiency Awards presentation--describe the use of slides and taped narration to introduce each award winner and the award category.

d. Describe the Public Speaking Contests--Extemporaneous and Prepared. Tell how the three finalists have come to be chosen.

e. Talk about the format at the section business meetings. Encourage interested members to consider running for sectional offices.

f. Gives information of the State FFA Band and Chorus. Encourage members with a musical ability to apply.

g. Answer questions on the election of the State FFA Officers:

- Current Section Presidents and the usual candidates for the four offices of President, Vice-President, Secretary-Treasurer, and Reporter.

- A candidate can drop down to lower offices.

- Several ballots are required to elect an officer.

- Only the 600 or so official delegates can vote to elect the officers.

4. WHAT SHOULD A CHAPTER DELEGATE DO WHEN HE/SHE RETURNS FROM THE CONVENTION?

   a. Give a summary of the convention program
   b. Report the business and election results from the section meeting.
   c. Give impressions of the Chapter Exhibits, U. of I. campus, etc.
   d. Explain the procedure and results of the State FFA officer elections.
   e. Answer members questions as they look over a past convention programs.
   f. Advise chapter members on ways to improve the local chapter.

Transparency on National FFA Convention

a.	WHAT:	National FFA Convention
b.	WHEN:	Second Week in November - Held annually
c.	WHERE:	Municipal Auditorium, Kansas City, Missouri
d.	WHO ATTENDS:	FFA Members, Advisors, Parents, Alumni, and Guests Usual attendance is around 20,000.
e.	WHAT HAPPENS:	- All of the traditional activities of a State FFA Convention. - Presentation of National Chapter Awards, Proficiency Awards, and the American Farmer Degrees. - Committee Work and Convention Business by the Official State Delegations. (Illinois has three delegates) - Speeches from honored guests, sports figures, and national political leaders. - National FFA Chorus and Band perform. - National FFA Officers give retiring addresses.

- The American Royal Livestock Show is going on concurrently.

- The Agricultural Career Show is held in the Convention Center.

Transparency on Illinois FFA Leadership Camp

1. While going through the transparency outline, identify the members from your chapter who have attended an Illinois FFA Leadership Camp. When did they attend?

2. If possible, get one of these members who has attended the camp to speak about his or her experience.

3. Encourage members to consider attending and to ask questions of the camp directors who are usually at the FFA Convention in June.

4. If a member shows an interest, help him or her to contact the State FFA Office for more details.

Transparency on Leadership Training Schools (L.T.S.)

1. Tell members the approximate time the event is held in your section each year.

2. If the L.T.S. is held at the home school of the Section President, explain that tradition and the fact that it is one of the Section President's responsibilities to organize this event.

3. If you have had a Section President from your chapter or hosted an L.T.S., tell of that event.

4. Do your chapter's officers attend the Section L.T.S. each year? If so, have a past or current officer tell the class about a typical officer session.

5. If the advisors hold a meeting at the L.T.S., explain the importance of this to the class, as well.

Transparency on FFA Chapter Banquet

1. Tell the class the usual date of your chapter's banquet (e.g., 1st or 2nd week of March)

2. If your chapter holds its banquet (or has held it) somewhere other than the high school, mention this and give any interesting reasons for the location.

3. Give the members a rundown of the usual people who attend other than members and their parents.
   Do you recognize local foundation contributors and community members who give support to your chapter?

Do you invite the school principal and superintendent, board of education members, and other faculty?

4. Do you try to have an FFA officer speak at your banquet? Tell of some other interesting programs that you have had.
   Do you ever have local talent for entertainment? If so, give details.

5. Detail the award winners, judging teams, and individual accomplishments that you try to recognize at your annual banquet.
   Do you give out Foundation Contribution certificates at the banquet - or recognize these supporters?
   How do you recognize State FFA Degree and American Farmer Degree winners?

6. Tell how you usually structure banquet organization - by committee - the chapter officers - or yourself as advisor.

7. If a member wants to volunteer for a banquet committee in the future - give an idea of when most of the planning and work takes place.

8. Ask the members if they can cite reasons that a banquet should be held each year.
   Get them to recognize the functions of a banquet: thanking the community, recognizing award winners, motivating future work.

<u>Transparency on FFA Committee Work</u>

1. Humorous definition

   Ask if the members understand the implication of the old definition of a committee.

2. When to have a committee?

   Mention some of the more important committees in your chapter (Banquet, BOAC, Heritage, etc.).

   Think of other aspects of your program of activities that could use a committee for planning or instituting.

3. Who serves on committees?

   Dispel the misconception that only good students or people with a particular talent serve on committees.

   Encourage younger members to volunteer for a committee, the next time one is chosen at a chapter meeting.

4. Who leads a committee?

The chairperson: He or she has the responsibility of keeping a committee on course and working. A good chairperson seeks to get all members' input and gives everyone some responsibility.

The members: A good committee is only as good as the members on it. All should seek to help the chairperson define the committee's task and move toward its accomplishment.

5. Who appoints a committee?

Usually the chapter president, often with the advisor's input or that of other chapter officers.

Explain to a younger member that if he or she has an interest in a particular committee or activity that doesn't have a committee, they should let you know.

Initiative is the most valuable resource for any committee member.

6. How should a committee work?

Point out to the members that a "good committee" works. Many people have tried to define what a good committee is, but it usually depends upon the job it has to do.

Examples: A chapter banquet committee should start early in the school year, so planning isn't left until a week before the event.

A B.O.A.C. committee should have input from community leaders on what a good project for the chapter would be. The point is, this committee can't make its decision alone without input.

7. When is a committee not working?

For the benefit of committee members who should be watching for signals that the committee isn't working as it should, have the class think of creative signs of "a committee in trouble."

After the brainstorming, give the class some of the following trouble signs or ones you have experienced in working with committees.

Trouble signs:

When the chairperson doesn't know who the members of the committee are.

SAMPLE TEST QUESTIONS

TEACHER'S KEY

DEVELOPING CITIZENSHIP SKILLS

I. Completion.

1. Four degrees which students can earn in the FFA are __Greenhand__, __Chapter__, __State FFA__, and __American__.

2. Three types of FFA committees are __Executive__, __Standing__, and __Special (ad hoc)__.

3. After returning home from the State Convention, chapter delegates should __report__ to the chapter members.

4. The Illinois FFA Convention is held at __Champaign__, Illinois in the month of __June__.

5. The National FFA Convention is held at __Kansas City__, Missouri in the month of __November__.

6. State officers elected at the state convention are __president__, __vice-president__, __reporter__, and __secretary-treasurer__.

II. True (T)-False (F) Section

T 1. The eleven standing committees of the FFA correspond to the major sections of a program of activities.

T 2. FFA committees should usually report their recommendations and accomplishments to the total membership.

F 3. A laissez-faire leader is one who does all the work.

F 4. Autocratic leaders usually depend on the membership to make decisions.

T 5. Each year, 2% of the FFA membership in Illinois may be elected to the State FFA degree.

F 6. All FFA members present at the Illinois FFA Convention can vote in the state officer election.

F 7. Committees are usually appointed by the FFA advisor.

T 8. The FFA Leadership Camp is designed to help chapter members attain leadership skills.

F 9. The State Secretary-Treasurer is responsible for the publication of "Your Illinois FFA," the state magazine.

F 10. "Leaders are born, not made."

III. Essay Questions

1. Six important leadership skills are -

   a. Ability to organize

   b. Ability to communicate

   c. Ability to motivate others

   d. Ability to manage time

   e. Ability to see group's objective

   f. Ability to stay informed

   g. Willingness to listen

   h. Willingness to delegate or assign responsibility

2. What are the purposes of an FFA Banquet?

   a. Recognize award winners

   b. Thank the community

   c. Motivate members

   d. Provide members with leadership training

   e. Inform public about FFA program

3. What are some signs that a committee is not functioning?

   a. Chairperson doesn't know who members are

   b. Committee has not met

   c. Committee has not reported to the advisor or members

   d. Committee members disagree on purposes of the committee

UNIT C: LEADERSHIP IN HORTICULTURE/AGRICULTURE

PROBLEM AREA: DEVELOPING BASIC PUBLIC SPEAKING SKILLS

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year students in horticultural occupations and should be taught during the spring semester in late January or February. A week or more should be reserved for the teaching of this problem area depending on the amount of practice time to be scheduled for students to give speeches and make presentations. In some schools instruction in communications skills, including speaking, is handled by the English or Speech Department. The horticultural occupations teacher should coordinate his or her instructional program with the instruction offered in other departments. The development of effective communications skills requires continuous attention throughout the year. The period for formal instruction in public speaking may last for only a few days; however, follow-up instruction and practice should be a part of every class session which involves student discussion and other communications activities.

CREDIT SOURCES:

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The teacher's guide was prepared by Paul Hemp, Department of Vocational and Technical Education. The study unit, review questions and test questions were prepared by Jim DeSutter, Vocational Agriculture Service, University of Illinois.

TEACHER'S GUIDE

I. Unit: Leadership in horticulture/agriculture

II. Problem area: Developing basic public speaking skills

III. Objectives: At the end of this problem area, the students will:

1. Be able to name three types of speeches and know when each type should be used.
2. Given a written copy of the manuscript, be able to identify the three parts of a speech.
3. Be able to define and or give examples of the following terms:
   a. Extemporaneous speech
   b. Prepared speech
   c. Supportive materials
   d. Gesture
   e. Non-vocal communications
   f. Articulation
   g. Pitch
   h. Stage presence
4. Be able to deliver a three-minute extemporaneous speech.
5. Be able to deliver a five minute prepared speech.
6. Be able to conduct conversation with confidence.

IV. Suggested interest approaches:

1. Ask class to name local, state or national leaders who are excellent speakers. What characteristics do they have in common?
2. Play one of the speeches given by National FFA Public Speaking finalists or by retiring national officers (tapes available from FFA Supply Service).
3. Relate to the class that "Effective communication is the life-blood of a democratic organization. Speaking is the most commonly used form of communications. We spend about 70 percent of our waking time in communications with others. Of this amount, 32 percent is spent in speaking and 42 percent is spent listening while 15 percent and 11 percent are spent reading and writing."
4. Invite a former speaking contest winner or FFA officer to the school to discuss importance of speaking and how to develop speaking skills.
5. Give a demonstration on "how not to give a speech." Ask class to identify mistakes made.

V. Anticipated problems and concerns of students:

1. How should I select subject and title for my speech?
2. How long should a speech be?
3. Should I use notes?
4. How can I overcome nervousness?
5. What are gestures and how should they be used?
6. What is the best way to practice my speech?
7. What are the parts of a speech?
8. What type of speech should I give?
9. How do I know that my speech fits the audience?
10. What are the purposes of a speech?
11. Where can I obtain good speech material?
12. How should I organize my material?
13. What is a good way to start a speech?
14. How should I end my speech?
15. How can I get the attention of the audience?
16. What are some suggested ways of delivering a speech effectively?
17. Should I use gestures? How?
18. What are the rules of the FFA Public Speaking Contests?
19. How should I talk on the telphone?
20. How should I introduce one person to another?

VI. Suggested learning activities and experiences:

1. When providing practice exercises assign short, simple and easy speaking assignments to students such as the following:

   a. Introduce one person to another.

   b. Explain or describe an object or speciman.

   c. Relate a personal experience.

   d. Make a telephone call or answer the telephone properly.

   Learning activities used early in the problem area should increase student interest and result in a successful and satisfying experience.

2. Have class establish goals for the public speaking problem area. These goals should be performance-based and may include competitive speaking.

3. Lead students in an identification of their problems and concerns. From this list, select those problems and concerns which can be answered or solved by reading the unit, "Steps to Becoming a Better Speaker." Conduct supervised study so students can locate and record answers to problems.

4. Conduct class discussion to validate students' answers and to formulate answers to other problems and concerns not previously handled.

5. Conduct a review session with class using the "Review Questions and Suggested Answers" included with this problem area.

6. Involve class in a "practice phase" to enable them to improve their speaking skills.

7. Have students write and deliver short speeches. Use tape recorder for playbacks and student evaluations.

8. Conduct an "in-class" public speaking contest to give students practice in speaking before a small audience.

9. Have class listen to tapes of national public speaking winner. Point out examples of different delivery methods and procedures used in the speeches.

10. Provide opportunities for students to give their speeches at FFA meetings, before school assembly or at local service club meetings.

11. If video-taping equipment is available, record student speeches for playback and evaluation.

12. Encourage students to participate in Sectional FFA public speaking contests.

13. Review FFA Public Speaking Contest Rules and Procedures outlined in "Illinois Advisor's Guide" with class.

VII. Application procedures:

1. Conduct chapter or inter-class speaking contest to give students practice in speaking before groups.

2. Arrange public speaking engagements for chapter winners with local civic groups or at service club meetings.

3. Participate in Sectional FFA Public Speaking Contest.

4. Monitor students' conversations and class discussions throughout the year to break bad habits and develop good speaking habits.

5. Provide opportunities for students to stand up in front of the class or chapter meeting to make reports and give presentations.

VIII. Evaluation:

1. Administer pencil and paper test using sample test questions included with this problem area.

2. Grade students on speaking performance exercises.

IX. References and aids:

1. National Officers Retiring Addresses. Tape available from National FFA Supply Service.

2. National Public Speaking Contest. Tape available from National FFA Supply Service.

3. FFA Leaders Speak—Leadership. Slide set and tape available from State FFA Office in Roanoke, Illinois.

4. Student Handbook, pp. 72-73.

5. Illinois FFA Advisor's Guide.

6. The FFA and You, 3rd Edition by Ralph Bender, Robert Taylor, Chester Hansen and L. H. Newcomb. Available from Interstate Printers and Publishers, Inc., Danville, Illinois, pp. 157-167.

7. VAS Unit 7002, "Steps to Becoming a Better Speaker."

REVIEW QUESTIONS AND SUGGESTED ANSWERS FROM "STEPS TO BECOMING A BETTER SPEAKER" *

1. You are asked to speak to a local service club in a nearby town about your FFA Chapter. What would be at least five questions you might want to ask about your audience before speaking to them?

    a. What is the name of the group?

    b. What is their purpose or aim?

    c. Who will be in the audience—all male, all females, or a combination of both?

    d. How old are they?

    e. What is their background—rural, urban or both?

    f. How much do they know about the FFA and what is their attitude toward FFA and agriculture in general?

    g. Has anyone else in the FFA chapter spoken there before?

    h. If so, how long ago did the chapter member speak there and what did he or she talk about?

    i. How many are expected to attend when I speak?

    j. Why are they meeting?

2. When should you find out the answers to any of these questions?

    You should always find out the answer to these questions ahead of time so you can be well prepared when you go to the speaking engagement.

3. In selecting a topic for your speech, should the topic be interesting to the speaker? Why or why not?

    In selecting a topic for a speech, the topic should be interesting to the speaker. If the topic is not interesting to the speaker, then most likely the speaker will be bored with the speech, and this attitude will be reflected on the audience. Thus, if the speaker is bored with the subject, then most likely the audience will be bored too.

4. Is it important to know how much time you are allowed to speak at a meeting or banquet? Why?

    It is very important to know how much time you have when speaking at a meeting or group function. This way you can prepare for your speech properly and be able to choose a topic in your time area. Otherwise, you may have too much information or too little for the amount of time they have given you for your speech. You may show up with a five minute speech and the audience might be expecting a 15 minute speech or vice versa.

* These questions and answers are based on VAS Unit 7002 "Steps to Becoming a Better Speaker."

5. What is the difference between an informative and persuasive speech?

An informative speech is a speech that involves giving the audience information and does not try to sway the opinion of the audience. A persuasive speech tries to influence the audience's thinking or actions.

6. What is supportive material and what is its purpose?

Supportive material can be any ideas, facts, examples, illustrations, opinions, and analogies. Supportive material helps clarify, explain, illustrate and/or prove the major purpose of a speech. It also helps amplify and prove ideas.

One final thing, supportive material may help convince an audience that the speaker's ideas are true, believable. It adds credibility to his or her speech.

7. Name at least six possible sources of supportive material for a speech.

a. books
b. magazines
c. government pamphlets
d. interviews
e. journals
f. brochures
g. manuals
h. newspapers
i. television programs
j. other speeches
k. yourself

8. List the five basic types of verbal supporting materials.

a. Comparison and contrast

b. Information

c. Testimony

d. Example

e. Definition

9. Informative support involves using facts, figures, and statistics. What is the difference between a fact and figure?

Facts are events that have actually happened, that are observable now, or that have been observed by competent persons. A fact is a single, isolated event that has happened. Figures on the other hand are not necessarily accurate or proven, but are more of an estimation.

10. What does a definition help the speaker do?

A definition helps the speaker explain the terms and the meaning of the words he or she may use.

11. What are the three parts of a speech? What is the proper order in which you should work on these three?

The three parts that a speech are the introduction, body, and conclusion. The body should be developed first, then the conclusion, and finally, the introduction.

12. When introducing a speech, what are five different approaches that the speaker may use?

    a. Humor.

    b. Telling a story that relates to the major point of speech.

    c. Using a quotation.

    d. Giving a startling statement.

    e. Giving background information or history on his or her speech topic.

13. Why should you never read a speech to an audience?

    You should never read a speech because you are then unable to get a feel of how the audience is responding to your speech. You cannot receive any "feedback". Also, when you read a speech you are more likely to glance up for a second and then lose your place when you look back down.

14. The final step before giving a speech is practicing it. What are three different ways in which you can practice your speech?

    a. Rehearse in front of a mirror to watch your hand gestures, how you stand, or how you move about.

    b. Rehearse in front of your family, friends, or FFA chapter so they can give you advice.

    c. Record you speech on a tape recorder and listen to it.

15. When working on your speech, list five questions that you may ask yourself about your voice and deliver.

    a. Is my voice clear?

    b. Is it loud enough?

    c. Do I pronounce my words correctly?

    d. Do I speak too fast?

    e. Do I have a lot of "and. . .ah's. . .ah's" in my speech?

    f. Does my speech sound like I am interested in my topic?

    g. Do I put emotion into my voice?

    h. Do I cut off my ending words in the sentence by talking too softy?

16. What are the six important steps in preparing a speech?

    a. Analyze your listeners and the specific occasion.

    b. Select your topic.

    c. Determine your specific purpose.

    d. Collect supporting materials.

e. Organize your speech.

f. Practice your speech.

17. When is the best time to work on the delivery of your speech?

The best time to work on the delivery of a speech is while you are practicing it.

18. What are the two ways in which a speaker conveys his or her message to an audience? Explain them briefly.

The two ways in which a speaker conveys his or her message to an audience are by vocal and non-vocal communications. Non-vocal language is the way in which your body communicates to the audience. It does not deal with your voice. Vocal communication deals with you voice and how it sounds (i.e., pitch, loudness, rate).

19. What are the five non-vocal tools that can help improve your delivery?

The five non-vocal tools that can improve your delivery are: posture, facial expression, movement, gestures, and eye contact.

20. What are four distracting habits that your hands can make while giving a speech?

a. Playing with a ring on your finger.

b. Running your hands through your hair.

c. Playing with the change in your pockets

d. Swinging your arms back and forth.

e. Tapping your fingers on the podium.

f. Looking at your hands and fingernails while you are speaking.

21. What is usually the best type of hand gesture to use?

The natural hand gesture is usually the best type of gesture to use because it is spontaneous and unrehearsed.

22. Why is eye contact important when speaking?

Eye contact is very important when speaking because if a speaker fails to maintain close eye contact, he or she loses the "feedback" that can be obtained from the audience. If a speaker does not know whether the speech is effective or not.

23. Why is pitch important to use in your voice when speaking?

Pitch is important when speaking because it can help you communicate to your audience your emotional feelings toward various parts of your speech. It adds variety in your speech and prevents the audience from being bored by a monotone voice.

24. What does good articulation mean? When speaking, what should you avoid doing so you can be articulate effectively?

Articulation refers to speaking clearly and distinctly. When speaking, avoid talking with anything in your mouth like gum, candy, a pencil or any other obstruction. Also, do not mumble, but speak clearly by opening your mouth.

25. What are the three basic types of speeches?

1. Speeches designed to inform.
2. Speeches designed for action.
3. Speeches designed to entertain.

26. What is the purpose of the informative speech?

The informative speech is designed to give the audience additional or new information on a topic. It does not involve the speaker giving his or her opinion.

27. What are four different methods that can be used when giving a persuasive speech?

a. Present only the viewpoint that you favor.
b. Use emotion.
c. Use the self-interest approach of how it may benefit each audience member.
d. Use group pressure.

28. Name the six different levels of competition in the FFA prepared and extemporaneous public speaking contests.

a. Chapter
b. Section
c. District
d. State
e. Regional
f. National

29. How many members from an FFA chapter are allowed to enter the prepared public speaking contest at the section level? How many can enter in the extemporaneous contest at the section level?

One chapter member can enter the prepared public speaking contest at the section level. One chapter member can enter the extemporaneous public speaking at the section level.

30. How many minutes does a speaker have to prepare his or her speech in the extemporaneous contest in an Illinois FFA contest? In the national FFA contest?

Each speaker is allowed 20 minutes in the extemporaneous public speaking contest to prepare his or her speech. In the national contest, each speaker is allowed 30 minutes.

31. What are the speaker's time limitations before receiving a penalty in the extemporaneous speaking contest in Illinois? At the national level?

A speaker is allowed a minimum of three minutes and a maximum of five minutes before receiving a penalty in the extemporaneous speaking contest. On the national level, the speaker is allowed a minimum of four minutes and a maximum of six.

32. How long do the judges have to ask questions in the extemporaneous and prepared contests?

The judges have five minutes to ask questions in the extemporaneous and prepared public speaking contests. (This pertains to Illinois as well as the national contests.)

33. What are the seven different areas that a judge grades the extemporaneous speaker on and how many points is each area worth?

The seven areas in which a judge grades an extemporaneous speaker on and their point value are:

a. Knowledge of subject – 200 points

b. Organization of material – 150 points

c. Voice – 150 points

d. Stage presence – 100 points

e. Power of expression – 100 points

f. General effect – 100 points

g. Response to questions – 200 points

34. In the Illinois FFA prepared public speaking contest, the subject must be chosing ahead of time. What are the other two requirements needed for the speaker's subject to be acceptable?

In order for a prepared public speaker's subject to be acceptable, it must be at an agricultural character and be presented as a problem-solution type of speech.

35. What are the speaker's time limitations before receiving a penalty in the prepared public speaking contest in Illinois? At the national contest?

The speaker's time limitations in a prepared public speaking contest are a minimum of six minutes and a maximum of eight minutes in both the Illinois and the national contest.

36. What are the two different areas in which a judge will grade a prepared public speaker on, but not on extemporaneous speaker?

The two different areas in which a judge will grade a prepared public speaker on, but not an extemporaneous speaker are content of manuscript and composition of the speaker's material.

37. What is the major difference between the national prepared public speaking contest and the Illinois prepared contest?

The major difference between the national and Illinois prepared public speaking contest is that at the national contest the speaker does not have to have a problem-solving approach.

38. When introducing a speaker, when do you want to announce his or her name? Why?

When introducing a speaker, you want to announce the speaker's name last. The speaker's name is more likely to be remembered if his or her name is announced at the end of an introduction.

SAMPLE TEST QUESTIONS AND TEACHER'S KEY
DEVELOPING BASIC PUBLIC SPEAKING SKILLS

True or False

True 1. Every audience is different and you must adjust your speaking habits to meet their needs.

False 2. You should not try to find out about your audience until you get to the speaking engagement.

False 3. If a group or organization asked you to speak about your FFA chapter to them, it would be impolite to ask about their group's activities, aims, and purposes, or knowledge of the FFA because you may embarrass them.

True 4. When you are selecting a topic to speak on, you should pick one that is interesting to you.

False 5. As long as the speech topic is interesting to you (the speaker), then you should not worry if your audience will like your topic or not.

False 6. You should never include your audience in a speech.

False 7. When picking a topic for a speech, you should not take into consideration how much time you have to speak.

True 8. By stating the purpose of a speech, you will be more likely to keep on the subject and away from rambling on aimlessly.

True 9. One of the best places to begin research for supporting materials is with yourself.

False 10. A FACT is a single or multiple event that has happened or that is predicted to happen.

False 11. When quoting a person in a speech, it is best to quote a person who the audience has not heard of in order to influence them more.

True 12. The EXAMPLE tries to help explain the situation and tries to clear up any unclear questions that an audience member may have.

True 13. When you are not sure if your audience will understand a word or term that you are using in your speech, you should define and explain this word or term to make sure they do.

False 14. Two important items that you must strive for in organizing your speech is making sure the speech is **clear and complex** enough to make it a challenge for the audience to listen to.

False 15. When working on a speech you should work on the introduction first, the body second and conclusion last.

True 16. The final step before the actual delivery of a speech is to practice it.

False 17. When walking to the speaker's platform or podium, you should walk at an easy and slow pace, so that you can gather your thoughts and not appear too eager to speak.

True 18. The natural hand gesture is usually the best type of hand gesture because it is spontaneous and unrehearsed.

True 19. In the Illinois FFA Prepared Public Speaking Contest, you must present your speech as a problem-solution speech and a speech of agricultural character.

False 20. In the Illinois FFA Prepared Public Speaking Contest, you are allowed a minimum of six minutes and and maximum of eight without penalty.

True 21. Your major goals when giving the introduction of your speech are to catch the audience's attention right away and get them interested in your speech.

False 22. The informative speech tries to move people to act either now or in the future.

False 23. When giving an action or persuasive speech, you should never give your own opinion or use emotion in your speech.

True 24. Speeches like demonstration, cause-effect and debates are variations of the information, action and/or entertainment speech.

False 25. When introducing a speaker, it is a good idea to put additional pressure on the speaker. Usually he or she will give a better speech if pressure is applied.

False 26. When giving an introduction, announce the speaker's name first so the audience can recognize him or her right away.

False 27. It is a good custom and tradition for the person introducing the speaker to try and out-do the speaker by telling jokes and giving a long introduction.

True 28. When giving out an award, it is proper to explain the award, tell why it is given out, and what the person has done to deserve it.

False 29. When going to an extemporaneous FFA public speaking contest, there is no reason to do any preparation at all since the speaker does not know what type of speech topic he or she will draw.

True 30. At the National FFA Public Speaking Contest, contestants are allowed a minimum of seven minutes and a maximum of nine minutes.

Completion Questions

1. Three sources that could be used as supportive materials are _____, _____ and _____. (Books, magazines, government pamphlets, interviews, brochures, newspapers, TV programs, other speeches.)

2. Three non-vocal tools which can help improve speech delivery are _____, _____, and _____. (posture, facial expression, movement, gesture, eye contact.)

3. Two types of FFA public speaking contests are prepared and extemporaneous.

4. Three types of speeches are speeches to inform, speeches for action, and speeches to entertain.

5. A speaker contest where the contestants have not prepared their speeches in advance is called a (an) _____ extemporaneous _____ contest.

Multiple Choice

__C__ 1. Which example could not be a fact.

A. Todd ran the 100 meter dash in 11 seconds.
B. The United States produced more corn than any other country in the world last year.
C. In five years, corn production per acre will have doubled since 1940.
D. The FFA was found in November of 1928.

2. When preparing a speech, the six steps listed below are very important in the preparation of a speech. Match these in the proper order in which they should be carried out.

__F__ 1. A. Select your topic.
__A__ 2. B. Organize your speech.
__D__ 3. C. Collect supporting material.
__C__ 4. D. Determine your specific type of speech.
__B__ 5. E. Practice your speech.
__F__ 6. F. Analyze your listeners and the specific occasion.

__B__ 3. In Illinois, how many minutes does a speaker have to prepare for an extemporaneous speech.

A. 30
B. 20
C. unlimited
D. 25

__C__ 4. In the Illinois FFA Extemporaneous Contest, how many minutes is a speaker allowed without penalty.

A. Minimum of three minutes and a maximum of six.
B. Minimum of four minutes and a maximum of seven.
C. Minimum of three minutes and a maximum of five.
D. Minimum of four minutes and a maximum of six.

__D__ 5. Which one of these rules is not true of the **national** extemporaneous public speaking contest?

A. Contestants have 30 minutes to prepare their speech.
B. Judges have eight minutes to ask questions.
C. Each speech shall not be less than four minutes or more than six minutes without penalty.
D. The contestant must pull one specific sub-topic from two of the three broad areas of Production Agriculture, Related Agricultural Production or Leadership.

UNIT D: Horticultural/Agricultural Mechanics

PROBLEM AREAS:

1. Cement masonry and concrete work
2. Managing greenhouse electrical systems
3. Servicing small gas engines
4. Glazing

UNIT D: HORTICULTURAL/AGRICULTURAL MECHANICS

PROBLEM AREA: DEVELOPING CONCRETE AND CEMENT MASONRY SKILLS

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year students in a horticultural occupations program. The recommended time for teaching this problem area is during the spring when the class could be involved in a concrete project out-of-doors. If such a class project is planned, the teacher should schedule at least a week for this problem area.

The materials in this problem area are based on the Cement Mason's Guide available from Portland Cement Association and VAS Unit 3007a available from Vocational Agriculture Service, University of Illinois. Teachers should order multiple copies of these materials prior to instruction. Also, Vocational Agriculture Service has a concrete kit for loan which could be used for laboratory exercises in the classroom or shop.

CREDIT SOURCES:

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The teacher's guide, information sheets, worksheets and laboratory exercise were developed by Paul Hemp and Ron Biondo, Department of Vocational and Technical Education, University of Illinois. The transparencies were prepared by Vocational Agriculture Service and the entire problem area was field tested by seven Metropolitan Horticulture teachers in Illinois.

TEACHER'S GUIDE

I. Unit: Horticultural/agricultural mechanics

II. Problem area: Developing concrete skills

III. Objectives: At the close of this problem area students will:

1. Know how to mix and lay concrete.
2. Be able to construct concrete forms.
3. Be able to use and care for concrete tools and equipment.
4. Understand how to calculate concrete problems.

IV. Suggested interest approaches:

1. Announce name of problem area and briefly describe it.
2. Find out how many class members have experience mixing concrete and ask those students to describe their experiences.
3. Have students name uses of concrete around the home landscape.
4. Lay out a collection of concrete tools. See if students can identify them.
5. Ask students to distinguish between cement and concrete. Is it correct to talk about a "cement walk"?
6. Have students name as many occupations as they can where skill in concrete is necessary.
7. Give students a preview of the laboratory and shop activities planned for this problem area.

V. Anticipated problems and concerns of students:

1. What is concrete?
2. What are the properties of concrete?
3. Why is concrete widely used in horticulture?
4. What ingredients are used in concrete?
5. What mixtures should be used for various purposes?
6. How should concrete be mixed?

7. What tools are needed and how should they be used and maintained?

8. How should concrete forms be constructed?

9. How can I calculate the amount of material needed for a given job?

10. How and when should reinforcing be used?

11. What are the steps in finishing?

12. What precautions should be observed in mixing and laying concrete?

13. How should footings be constructed?

14. How should mortar be mixed and used?

15. What is an anchor bolt? What is its purpose?

VI. Suggested learning activities and experiences:

1. Conduct an interest approach to arouse student interest and develop a need for learning about concrete.

2. Have class develop a list of learning objectives for this problem area. Use the following lead questions:
   a. "What should we be able to do at the close of this problem area?"
   b. "Why is it important for us to learn about concrete?"

3. Lead students in the identification of their problems and concerns.

4. Reorder the problems and concerns.

5. Conduct supervised study so students can read the reference material and locate information needed to solve problems.

6. Continue supervised study and discussion periods until students can answer all questions which call for knowledge or cognitive answers.

7. Use transparencies to supplement information gained during supervised study or to bring out material not included in the references.

8. Conduct demonstrations outlined in VAS Unit 3007a "Concrete Improvements for Farm and Home."

9. Obtain the concrete kit from Vocational Agriculture Service and use it to perform laboratory exercises described on page 23 of VAS Unit 3007a.

10. Involve class in a concrete or block laying project in the community. Identify a small concrete job which students can handle and use it as a learning experience.

11. Conduct a field trip to visit a concrete ready-mix plant or building supply dealer.

12. Have students define the following terms:

a.	concrete	g.	reinforcing
b.	cement	h.	Portland cement
c.	aggregate	i.	striking off
d.	footing	j.	darbying
e.	form	k.	mortar
f.	curing	l.	jointer

13. Have students work problems involving concrete mixes and estimates of materials needed.

14. Use "Sample Discussion Questions" near the end of the problem area to show students how what they are learning will be useful on-the-job.

VII. Application procedures:

1. Involve the class in an actual concrete project.

2. Encourage students to build an improvement project at home which involves concrete work.

VIII. Evaluation:

1. Construct and administer a pencil and paper test using test questions included in this problem area.

2. Grade student laboratory work or projects.

IX. References and aids:

1. VAS Unit 3007a "Concrete Improvements for Farm and Home" available from Vocational Agriculture Service.

2. Phipps, Lloyd J. Mechanics in Agriculture, 2nd Edition, Chapters 31, Interstate Printers and Publishers, Inc., Danville, Illinois.

3. Cement Mason's Guide available from Portland Cement Association, 5420 Old Orchard Road, Skokie, Illinois 60077. Order the 1980 edition available for $3.50 per copy.

INFORMATION SHEET

CONCRETE TERMS

1. Portland Cement - Portland cement is a manufactured product made from limestone and clay or shale. It is ordinarily sold in paper bags each containing 1 cubic foot of cement.

2. Concrete - Concrete is an artificial stone composed of Portland cement, sand, gravel or broken stone and water which when properly mixed and "set", forms "homemade" stone.

3. Hydration - Hydration is a chemical process that takes place when cement and water are mixed.

4. Aggregates - Aggregates are materials which are used in the making of concrete to give bulk to the mixture. They are classified as fine (sand) or coarse (gravel, crushed rock or stone, or pebbles).

5. Ready-Mixed Concrete - Ready-mixed concrete is concrete mixed at a central location, blended during transit and delivered ready to pour at the job site.

6. Cubic Yard - A cubic yard of concrete is a volume equivalent to a cube which is 3 feet on each side.

7. Reinforcement - Material such as steel mesh or bars which is added to concrete to give it added tensile strength.

8. Forms - Forms are enclosures used to mold and hold new concrete in shape until it has been set.

INFORMATION SHEET

SAMPLE DISCUSSION QUESTIONS

Assume that you have graduated from high school and have been employed with a local concrete company as a field representative. You encounter several problems which your customers expect you to solve. How would you respond to the following situations?

1. As you arrive at the office this morning you find a note on your desk from your secretary. It said that the rains last night had wet the sand pile and the workers were wondering if they should adjust their mixture. You go out and look at the sand, take a handful and squeeze it. It feels wet and forms a ball when squeezed and leaves a little moisture on your hands. They want to mix a water tight batch, and need to know how much water to use per sack of cement.

2. When you get back to your office there is a call from a home owner. She wants to mix a batch of concrete for a sidewalk. She wants to use the pond water in the mix and was wondering if it would be OK. What advice could you give her?

3. Your first field assignment of the day was to go out to see Mr. and Mrs. H. C. Jones. They had poured a slab of concrete last year for a patio and it was already chipping off. When you arrive you notice a limestone driveway near the house with gravel in it. You inquire and the homeowners said they thought that rock was rock and it was handy to use rock from the driveway. What would you do or say to convince them that it was not the cement that was causing the patio to chip away?

4. On your way back to town your secretary called you on the two-way radio and said that the Smith family had started pouring a reinforcing wall in the landscape and was not going to be able to finish today because they were running out of sand. They want to know how to make the wall water-tight at the joint. What would you tell them?

5. When you get back to your office this afternoon your secretary said that a Mr. Avis called and you were to call him back. When you called he said that he was getting ready to pour a patio and he was wondering if there was any advice you could give him about the forms. What would you tell him?

6. On your way back from Mr. Avis's house you are to go by Allen Beck's residence. When you get there they had just finished pouring sidewalk and steps. They said that they wanted a "rough" finish on the steps and a smooth finish on the sidewalk, but had forgotten how to correctly finish them. They want you to outline the steps for them to follow.

7. Your last stop of the day is at Jim Scotts. He had just finished pouring a concrete floor and was wanting it to be as hard as possible. He thinks that concrete hardens if it dries fast. What advice could you give him on how to obtain the hardest possible concrete.

8. When you arrive back at the office that evening your secretary tells you that you are to give a speech at a local meeting. The topic is to be on the "Advantages of Concrete". You remember that while in high school you covered concrete in your Horticulture class. How would you outline your speech?

STUDENT WORKSHEET

CONCRETE PROBLEMS

1. How many cubic yards of concrete are needed to construct a 4-inch floor for a building which is 20 feet wide and 30 feet long? Note: A cubic yard is 27 cubic feet.

2. How much cement, fine aggregate and coarse aggregate will be required for the amount of concrete calculated for Problem #1? Note: Use a 6-gallon mix of 1: 2: 3.

LABORATORY EXERCISE

SILT TEST

I. Materials:

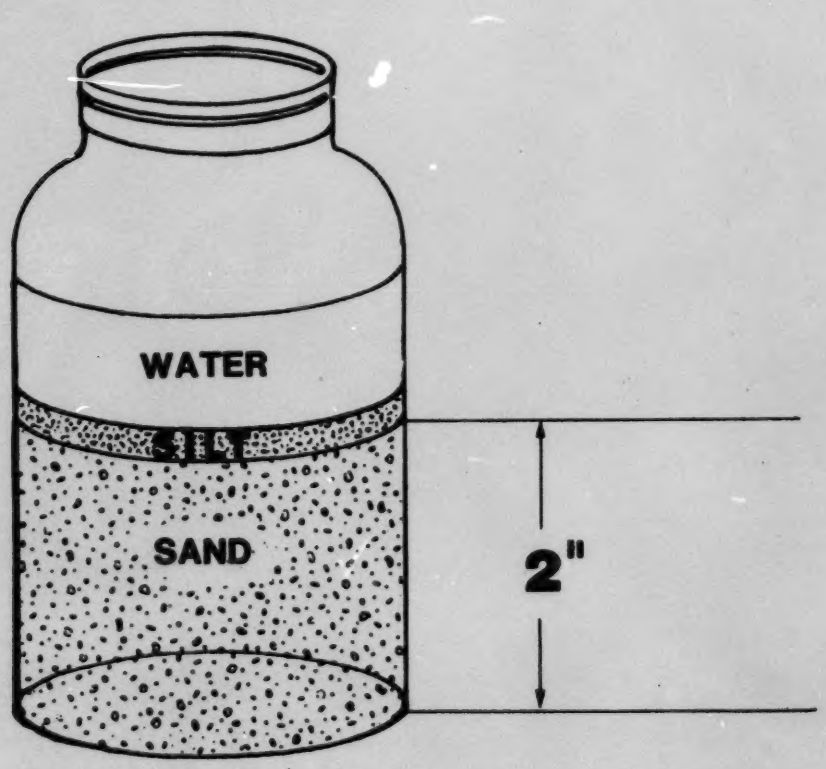
1. Quart jar with lid.
2. Sand samples to fill jar 2 inches deep.
3. Water.

II. Purpose:

1. To determine how "dirty" sand samples are.
2. To decide whether or not a sand sample is suitable for making concrete.

III. Procedures:

1. Place 2 inches of sand in a glass fruit jar and fill it with water until it is about three-quarters full.
2. Shake jar vigorously for a minute or two.
3. Allow to settle for one hour.
4. Measure silt layer which will settle out on top of the sand.



IV. Observations:

1. How thick is the silt layer?

2. Should this sand be used in a concrete mix?
   Note: If layer is more than 1/8 inch thick, sand is too dirty for concrete mixtures.

3. How could the sand be "cleaned"?

LABORATORY EXERCISE

CASTING EXPOSED AGGREGATE CONCRETE ROUNDS

Purpose:

To gain practical experience working with concrete.

Materials:

1. Cement mixer or wheel barrow
2. Strikers
3. Square-nose shovel
4. Garden hoe
5. Floats
6. Cement trowels
7. Portland cement
8. Water
9. Torpedo sand
10. Gravel or aggregate
11. ½" plywood rounds 1' to 4' in diameter
12. 16 gauge tin cut into 2½" wide strips
13. Reinforcing mesh (6" x 6", 6 gauge) or chicken wire or coat hangers
14. Baling wire
15. Roofing nails

Procedure:

1. Cut the 16 gauge tin into 2½" strips and the plywood into 1' to 4' diameter rounds.

2. Fasten the tin strips around the plywood rounds with baling wire and roofing nails. The tin strips may need to be shortened for the smaller rounds.

3. Cut portions of the reinforcing mesh to fit inside the forms. Prop the mesh up on stones so it will be in the center of the concrete. Coat hangers may be cut and lashed together to serve the same purpose.

4. Mix the concrete in a cement mixer or a wheel barrow. The recommended mixing ratio is 1 part sand, 2 parts aggregate, 1.5 parts cement and 6-7 gallons of water/sack of cement. NOTE: The aggregate used for exposed aggregate does not provide optimum strength of the concrete. Therefore, more than the usual 1 part cement is added.

5. Pour the concrete mix into forms, screed (strike off) and float.

6. After the concrete has firmed up (usually between 1 and 4 hours depending on weather conditions) wash off the "butter" on the concrete to expose the aggregate. Some light brushing may be necessary, but do not scrub the surface. Scrubbing will loosen

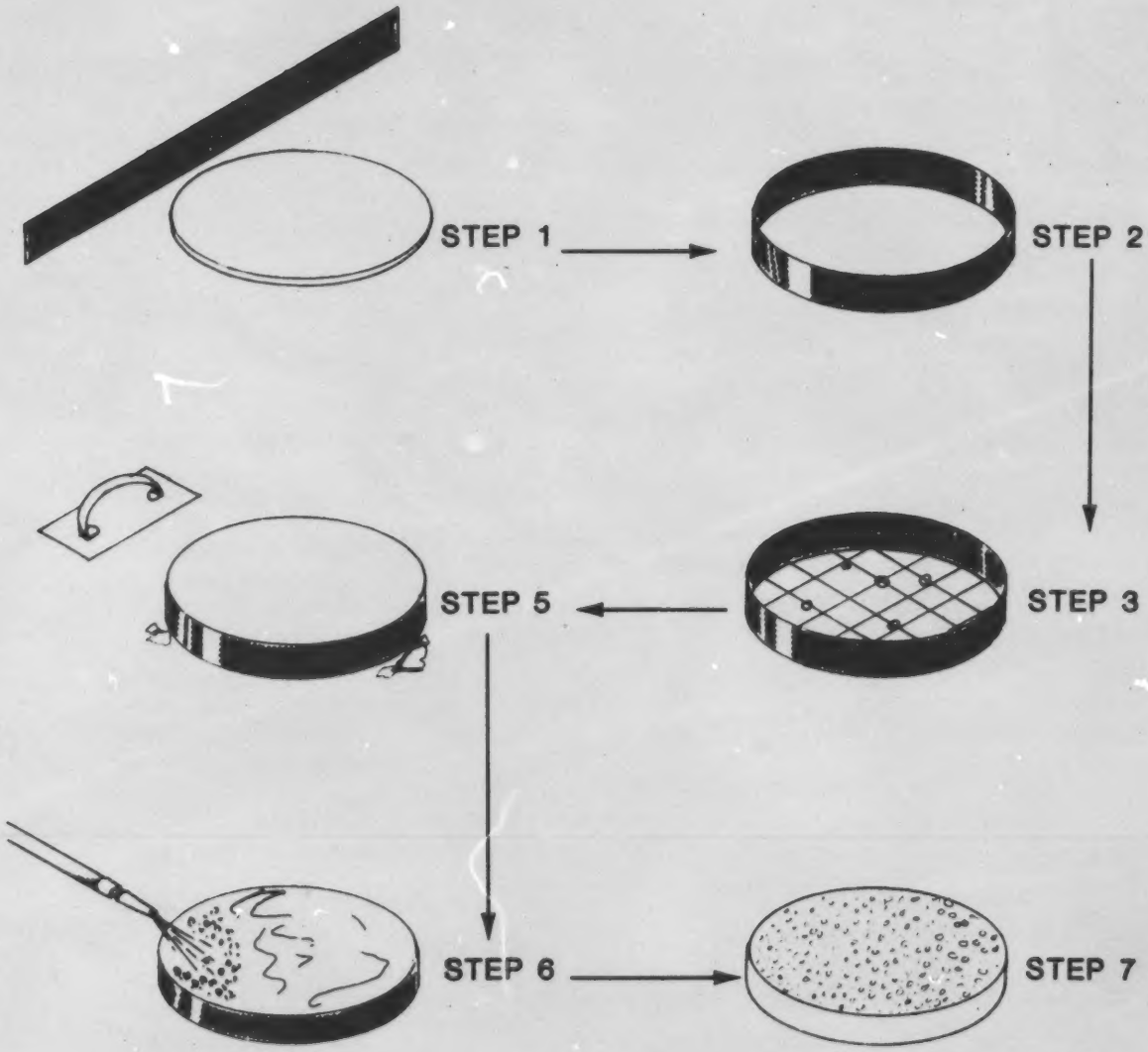
the aggregate. Timing is critical for exposing aggregate, and some practice rounds should be made before mass production is attempted.

7. Remove the forms and the plywood.

8. Submerge the rounds in water for several days to cure the concrete.

9. Wash the rounds with muriatic acid.

10. To obtain a glossy finish, treat the rounds with hydroseal.



TEACHER'S KEY

STUDENT WORKSHEET

CONCRETE PROBLEMS

1. How many cubic yards of concrete are needed to construct a 4-inch floor for a building which is 20 feet wide and 30 feet long? Note: A cubic yard is 27 cubic feet.

$$\frac{\text{Width} \times \text{length} \times \text{thickness (all in feet)}}{27} = \text{cubic yards of concrete}$$

$$\frac{20 \times 30 \times .33}{27} = 7.33 \text{ cubic yards}$$

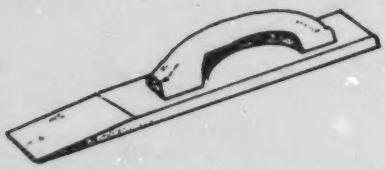
2. How much cement, five aggregate and coarse aggregate will be required for the amount of concrete calculated for Problem #1? Note: Using a 6-gallon mix of 1: 2¼: 3, we will need 6¼ sacks of cement, 14 cu. ft. of fine aggregate and 19 cu. ft. of coarse aggregate for one cubic yard of concrete.

Materials needed for 1 cu. yd. of concrete:
- 6¼ sacks of cement
- 14 cu. ft. of fine aggregate
- 19 cu. ft. of coarse aggregate

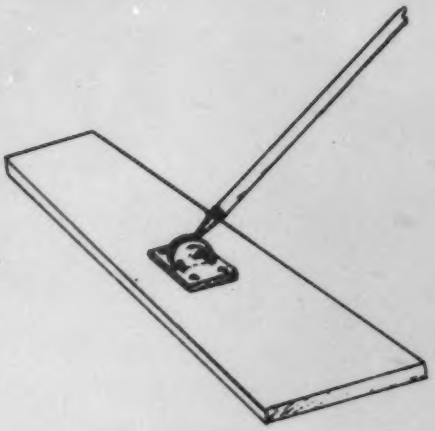
For 7.33 cu. yards, we will need:
- 6.25 x 7.33 = 45.8125 sacks of cement
- 14 x 7.33 = 102.62 cu. ft. of fine aggregate
- 19 x 7.33 = 139.27 cu. ft. of coarse aggregate

TOOLS USED IN CONCRETE WORK

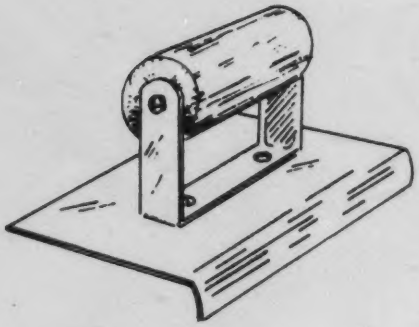
Magnesium Float



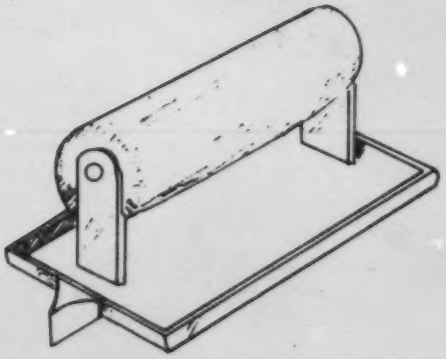
Wood Float



Bullfloat



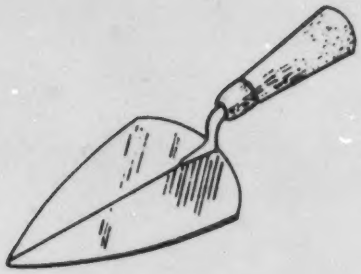
Edger



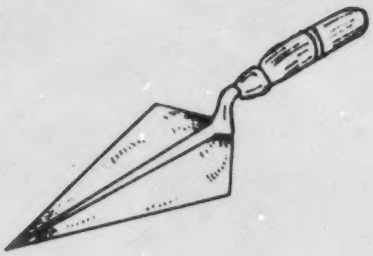
Jointer or Groover

Jointing Tool

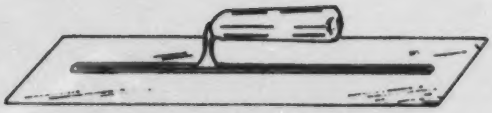
TOOLS USED IN CONCRETE WORK



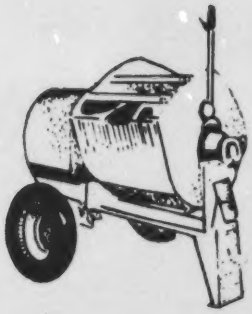
Brick Trowel



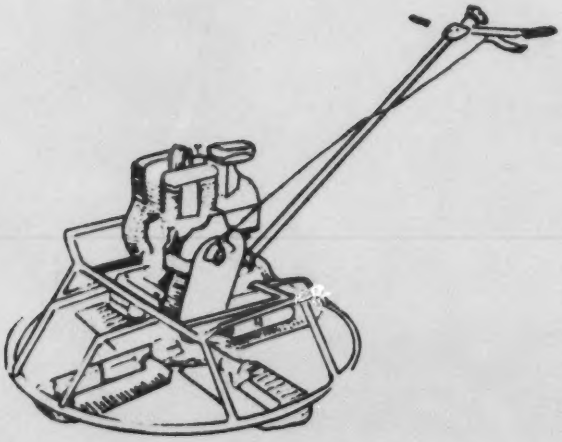
Pointing Trowel



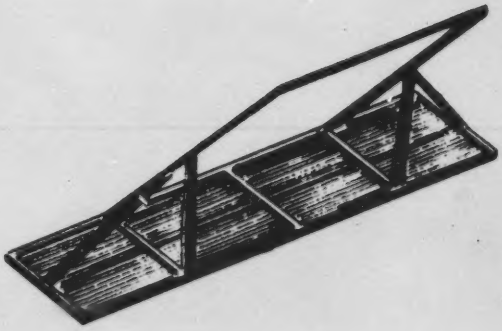
Finishing Trowl



Concrete Mixer



Power Trowel



Jitterbug

CONCRETE MIXING RATIO
Foundation Footing and Walls

1 : 2¾ : 4 – 7

Parts (cu ft) of Cement	Parts (cu ft) of Sand	Parts (cu ft) of Aggregate	Gallons of Water

CONCRETE MIXING RATIO

Water-tight floors and Foundations

1 : 2¼ : 3 – 6

Parts (cu ft) of Cement	Parts (cu ft) of Sand	Parts (cu ft) of Aggregate	Gallons of Water

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

DEVELOPING CONCRETE AND CEMENT MASONRY SKILLS

Completion

1. Concrete is a mixture of two components which are paste and aggregate.
2. The paste component is composed of Portland cement, water and air.
3. Driveways for single-car garages are usually 10 to 14 feet wide.
4. Driveways which accommodate passenger cars should be 4 inches thick.
5. The first step in building a drive or walk is preparation of the subgrade.
6. The finished grade of concrete slab can be controlled by accurate setting of side forms.
7. Use a leveling device to install side forms for concrete.
8. A full-float or darby is used after strikeoff to level ridges and/or fill voids.
9. Finishing operations include edging, jointing, floating, troweling, and brooming.
10. A process which involves a chemical reaction between cement and water to cause hardening is called hydration.
11. Proper curing conditions depend on the right combination of water and temperature.
12. Exposed aggregate is a popular decorative concrete finish.
13. Sections or pieces of concrete purchased to construct walks or patios are called precast concrete.
14. A cubic yard is the same as 27 cubic feet.
15. Prepackaged mixes or hand mixing are usually recommended for small jobs requiring less than 27 cubic feet of concrete.
16. Material added to concrete to increase tensile strength is called reinforcement.

Essay

1. List and/or describe the steps involved in the preparation of a subgrade.

   a. Remove organic matter (grass, roots, etc.) and debris.
   b. Fill low spots or holes with granular material.
   c. Compact the fill material.
   d. Dampen the subgrade to make it uniformly moist.

2. What operations are used to finish concrete?

   a. Edging. Use an edger to round off exposed edges.
   b. Jointing. Use a groover to make joints.
   c. Floating. Use a hand float to smooth the surface.
   d. Troweling. Use a steel trowel to produce a smooth, hard, dense surface.
   e. Brooming. Use a stiff broom to produce a rough surface.

3. What special precautions should be taken during the curing process?

   a. Keep concrete from drying out too fast.
   b. Maintain favorable temperature levels.

True (T) - False (F)

T 1. Fine aggregate is always sand.

T 2. As the amount of water is reduced, the strength of the paste increases.

T 3. Private walks leading to the front entrance of a home should be 3 to 4 feet wide.

F 4. Private residential walks should be 2 to 3 inches thick.

T 5. Patios should be designed as part of the house.

F 6. A free-form patio is usually rectangular in shape.

F 7. Stakes to hold side forms should extend 2 to 3 inches above the form.

F 8. Ready mix producers will usually not deliver less than 3 yards of concrete.

T 9. Strikeoff is an operation which removes excess concrete to bring the surface down to grade.

T 10. Concrete can be overworked.

F 11. Begin finishing operations as soon as concrete has been leveled.

F 12. Mortar sand can be used to make concrete.

UNIT D: HORTICULTURAL/AGRICULTURAL MECHANICS

PROBLEM AREA: MANAGING GREENHOUSE ELECTRICAL SYSTEMS

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with sophomore or second-year students in a horticultural or agricultural occupations program. The recommended time for teaching this problem area is during the spring semester.

The estimated instructional time for this problem area is 3-5 days, depending on how far the teacher wishes to go in developing student understanding of electrical systems at the second-year level. If the teaching plan is limited to classroom discussion with little or no practice or observation, the instructional time can be 3 days or less. If the students are to be involved in other activity exercises, the instructional time will need to be increased.

The instructor is encouraged to conduct a local search to locate other supplementary materials for use with this problem area. The items in this problem area are for reference or modification as instructors adapt this problem area to their local situation.

CREDIT SOURCES:

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The teacher's guide, student information sheets, job sheets, transparency discussion guide, and test questions were developed by Betty Van Dyke and Jerry Pepple, Department of Vocational and Technical Education, University of Illinois. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Field Test Teachers.

TEACHER'S GUIDE

I. Unit: Horticultural/agricultural mechanics

II. Problem area: Managing greenhouse electrical systems.

III. Objectives: At the close of this problem area, students will:

1. Understand fundamental principles of electricity.

2. Be familiar with electrical materials and electrical equipment in the greenhouse.

3. Be aware of electrical servicing-need and potential electrical hazards.

IV. Suggested interest approaches:

1. Ask students to list all greenhouse equipment that uses electricity.

2. Use Greenhouse Electrical Materials and Equipment Survey to familiarize students with all the electricity requiring equipment and electrical materials used in the school greenhouse. First, locate and check off those which are in the greenhouse, and label each with a number. Next, provide the students with greenhouse and electrical supply catalogs and let them identify each item.

3. Show the students electrical materials and equipment which need servicing and/or which represent electrical hazards, i.e., frayed insulation, corroded terminals, motors laden with dust and oil, improper splicing, etc. Refer to VAS Unit 3012a pp. 5-20 for factors which contribute to electrical hazards and specific causes of electrical hazards.

V. Anticipated problems and concerns of students:
(The answers to these questions can be found in VAS Units 3003b, 3012a, 3016a and "Electrical Motors for Farm Use.")

1. Should I do the servicing or should I call in a professional?

2. Which servicing needs and electrical hazards should I look for?

3. What do I do when an electrical accident occurs?

4. What do voltage, amperage, watts and resistance mean in electricity?

5. What is the relationship between voltage, amperage, watts and resistance?

6. What are the hot, neutral and ground wires and how can I recognize them?

7. What precautions must be taken in greenhouse electrical wiring and equipment use?

8. How can I be sure of the quality of electrical materials and equipment that I use?

9. Who writes the National Electrical Code and is it a law?

10. How do ground-fault circuit interrupters (GFCI) work?

11. Under what conditions must I be particularly careful of electrical shock?

12. How do you read electrical wiring diagrams?

13. What are fuses and circuit breakers used for and how do they work?

14. How do I identify types of motors?

15. What information is on a nameplate and how is that information useful to me?

16. What care should I give an electric motor?

VI. Suggested learning activities and experiences:

1. Conduct an interest approach and identify problems and concerns of the students concerning electricity and its use.

2. Provide students with VAS Unit 3003b and have them read the first two sections on fundamentals of electricity and safety and adequacy. Use the Teacher Information Sheet on "Suggested Electric Bowl Questions" to conduct an electric bowl contest or use it as a student worksheet.

3. Conduct surveys using the Student Information Sheet on Greenhouse Electrical Awareness and Safety Survey. Provide VAS Units 3003b, 3012a, 3016a and Electric Motors for Farm Use and Applying Electrical Controls in Farm Production and Supply Catalogs for supervised study. Use selected transparencies to discuss automatic control systems.

4. Have students conduct electrical hazard hunt in their homes, using Survey on page 31 in VAS Unit 3012a.

5. Use Job Sheets 1, 2, and 3 along with selected transparencies to provide additional skills in electrical wiring, and Job Sheet 4 for motors.

VII. Evaluation:

1. Give a test using appropriate questions from suggested test questions included in this problem area.

2. Evaluate students' work on electrical awareness and safety survey.

3. Evaluate student performance in completing assigned job sheet exercises.

VIII. References and aids:

1. University of Illinois, Vocational Agriculture Service.

a. Subject matter units:

#3003b "Planning for Electrical Wiring"
#3016a "Electrical Wiring Procedures"
#3012a "Electrical Hazards in Home, Farm and Business"

b. Slidefilms:

#303C "Identification of Electrical Wiring Items"
#416 "Cleaning Electric Motors"
#417 "Practical Maintenance of Electric Motors"

c. Transparencies:

Wiring Exercises
Electrical Accidents - Powerline Hazard and Study Guide
Electric Motors

d. Miscellaneous:

Electrical Wiring Kits
Student Exercises for Control Kits
Electrical Wiring Exercises
Study Guide for Wire Samples in Wiring test
Electric Motors for Farm Use
Applying Electrical Controls in Farm Production
National Electrical Code

12. (short answer) State one of the formulas which expresses the relationship of volts, amps and watts.
    volts x amps = watts
    volts = watts ÷ amps
    amps = watts ÷ volts

13. (fill in the blank) The power of electric motors is measured in horsepower.

14. (short answer) What is a kilowatt hour?
    1,000 watts of electric power used for one hour.

15. (fill in the blank) Another word for electric friction is resistance.

16. (one word answer) What term indicates the amount of electrical resistance? Ohms

17. (fill in the blank) volts = amps x ohms

18. (one word answer) How many amps of current at 240 volts will flow through a circuit having a resistance of 8 ohms?

    $240 = \text{amps} \times 8$

    $\frac{240}{8} = \text{amps}$

    $30 = \text{amps}$

19. (T-F) Resistance causes an increase in energy.
    False

20. (Multiple choice) Copper is a (A) low resistance or (B) high resistance material.
    (A) low resistance

21. (Multiple choice) The filament of a lamp bulb on the element of a heating appliance is of a metal or alloys with (A) high resistance (B) low resistance. (A) high resistance

22. (fill in the blank) Materials used to stop the flow of electricity or confine it to intended paths are called insulators.

23. (short answer) Name two insulating materials.
    Glass, porcelain, rubber, some plastics.

24. (short answer) What is the equation for Ohm's law?
    $\text{Ohms} = \frac{\text{Volts}}{\text{Amps}}$.

25. (short answer) What is the power equation?
    Watts = amps x volts.

TEACHER INFORMATION SHEET

SUGGESTED ELECTRIC BOWL QUESTIONS
(The questions could also be used as a student worksheet)

These questions are from VAS Unit 3003b, Planning for Electrical Wiring, pages 1-13; VAS Unit 3012a, Electrical Hazards in Home, Farm and Business, pages 1-24; VAS Unit 3016a, pages 1-10.

Before reading each question or statement to the bowl participants, explain what type of question or statement it is, i.e., True-False, Short Answer, Multiple-Choice, Fill-in-the-Blank, One-Word Answer.

Each question is worth one point.

1. (fill in the blank) An electric current may be considered to be a flow of tiny particles called electrons.

2. (fill in the blank) Voltage is the pressure that causes electrons to flow through the circuit somewhat like water through a system.

3. (one word answer) What is the name of the instrument used to measure voltage? Voltmeter

4. (short answer) How does the voltmeter measure voltage? The instrument connects across two wires of the circuit and measures the difference in electrical pressure between them.

5. (short answer) What is the function of a transformer? It steps up or down the voltage of an alternating current.

6. (T-F) As the current passes through the transformer into the farm site, the voltage is stepped up. False

7. (fill in the blank) A neutral wire extends from the transformer to the earth.

8. (fill in the blank) The number of electrons that pass a certain point in a given length of time is expressed in amperes.

9. (multiple choice) A current of one ampere means that (A) over 6 quintrillion or (B) about 6 thousand electrons pass a given point in the circuit in one second. (A) over 6 quintrillion

10. (multiple choice) Electric power is measured in (A) voltage (B) amperes (C) watts. (C) watts

11. (short answer) What is the definition of a watt? It is the power delivered by one ampere of current flowing at a pressure of one volt.

26. (two-word answer) What organization inspects and tests the quality of electrical devices and materials to see if they meet minimum safety standards?
Underwriter's Laboratory

27. (one word answer) Are ground-fault circuit interrupters designed to protect people or equipment? People

28. (T-F) Ground-fault circuit interrupters are substitutes for fuses and circuit breakers. False

29. (T-F) Ground-fault circuit interrupters are designed to detect a very small current leakage. True

30. (Fill in the blank) It is most important to use GFCI's when moisture is present.

TEACHER INFORMATION SHEET

GREENHOUSE ELECTRICAL MATERIALS AND EQUIPMENT SURVEY

GENERAL reference: VAS Unit 3003b pp. 13-26

____ wiring diagram showing circuits, wire size, controls, switches, junction boxes and loads for each circuit
____ a map showing location of underground conductors
____ other _____

SERVICE EQUIPMENT reference: VAS Unit 3016a pp. 1-10

____ service entrance
____ service entrance ground wire
____ main service disconnect
____ fuses, circuit breakers
____ other _____

WIRING AND LIGHTING reference: VAS Unit 3003b pp. 27-43; VAS Unit 3016a pp. 11-24

____ duplex receptacles
____ keyless receptacles (light)
____ receptacle - fuse unit
____ single pole switch
____ three-way switch
____ four-way switch
____ conduit
____ conductors, neutral and ground wires (note sizes)
____ transformer - 24 volt
____ other _____

MOTORS reference: Electrical Motors for Farm Use

____ nameplates of equipment with electrical motors
____ equipment with split-phase motor
____ equipment with capacitor motor
____ equipment with repulsion-start motor
____ equipment with universal or three-phase induction motor

EQUIPMENT	VAS reference: Applying Electric Controls in Farm Production Supply Catalogs & Owner Manuals.

____ propagation mats and thermostat
____ propagation lights
____ soil-warming cables
____ soil-warming mats
____ soil sterilizer
____ temperature control system
____ temperature alarm system
____ humidity control system
____ fertilizer injectors
____ irrigation system
____ mist propagation system
____ pump
____ pad and fan cooling system
____ vent control system
____ shade control system
____ heating system

GENERATOR

____ electric generator

STUDENT INFORMATION SHEET

GREENHOUSE ELECTRICAL AWARENESS AND SAFETY SURVEY

Yes	No	
GENERAL		reference: VAS Unit 3003b, pp. 13-26
____	____	Is there a wiring diagram showing circuits, wire size, controls, switches, junction boxes and loads for each circuit?
____	____	Is there a map available showing location of underground conductors?
SERVICE EQUIPMENT		reference: VAS Unit 3016a, pp. 1-10
____	____	Is an approved service entrance used?
____	____	Is service equipment mounted on a fire resistant panel?
____	____	Does the building have a main service disconnect?
____	____	Is service entrance properly grounded?
____	____	If fuses are used, are spare fuses of the proper size available?
____	____	Are circuit breakers operable, free of corrosion?
WIRING AND LIGHTING		reference: VAS Unit 3003b, pp. 27-43, VAS Unit 3016a, pp. 11-24
____	____	Are all electrical receptacles waterproof?
____	____	Are greenhouse circuits protected with ground-fault interruptors?
____	____	Are all switches in greenhouse waterproof?
____	____	Are all circuits equipped with grounding conductors?
____	____	Are all portable tools double insulated?
____	____	Are all portable tools equipped with a grounding conductor and a three-prong plug?
____	____	Is insulation on conductors in good condition?
____	____	Are lights located so they are not subject to breakage damage by workers or equipment?
____	____	Are circuits turned-off when bulbs are cleaned or replaced?
____	____	Are all light bulbs in waterproof enclosures?

MOTORS reference: VAS booklet, Electrical Motors for Farm Use

____	____	What is the information on the nameplate of each motor?
____	____	Are protective devices small enough to protect motors?
____	____	Are motors cleaned regularly so they do not overheat?
____	____	Are motors free from excessive bearing wear?
____	____	Are motors lubricated according to manufacturers' recommendations?
____	____	Do motors have automatic thermal overload protection?
____	____	Are all motors grounded?
____	____	Are motors free from excessive vibration?
____	____	Are driven belts, chains, gears and shafts protected?

EQUIPMENT reference: VAS publication, Applying Electric Controls in Farm Production

____	____	Are water pumps checked regularly for electrical hazards?
____	____	Are ventilating fans checked and cleaned regularly?
____	____	Are thermostats checked for proper operation?
____	____	Are motor controllers in waterproof enclosures?
____	____	Are noisy relays checked?
____	____	Are switches and equipment free of rust and corrosion?

STAND-BY GENERATOR

____	____	Is generator started regularly to check operation?
____	____	Is transfer switch of proper type?

JOB SHEET 1

WIRING DUPLEX RECEPTACLE

OBJECTIVES:

1. To be able to identify selected electrical items and tools correctly.
2. To be able to diagram an unswitched duplex receptable with unswitched line in and line out correctly.
3. To demonstrate how to wire an unswitched duplex receptacle properly within standard established by National Electrical Code.

MATERIALS:

1. 2 pieces of ½-inch thinwall conduit.
2. indoor conductors of proper length and color
3. 1 handy box
4. 1 grounding-type duplex receptacle
5. 1 handy box cover for duplex receptacle
6. 2 connectors for ½-inch thinwall conduit
7. electrical tools (screw driver, wire cutters, needle-nosed pliers)

PROCEDURE:

1. A grounding-type receptacle is needed near the door of the greenhouse for a portable saw.

2. Properly diagram this exercise using pictorial or schematic symbols.

3. Select proper electrical tools and equipment needed for this exercise.
4. Complete exercise but leave covers off receptacle until instructor inspects wiring and connections. After approval, finish exercise and let instructor test it for proper operation.

QUESTIONS:

1. What type and size of wire did you use for this exercise?

2. What length of wire should be available in the receptacle box?

3. What color of wires did you attach to the different terminal screws?

4. What does the National Electrical Code recommend for grounding receptacles when wiring with conduit?

OBSERVATIONS:

What special tools were used, skills developed, and information learned by observing or demonstrating this exercise? What safety precautions did you observe?

APPLICATIONS:

Name or describe some situations where this skill could be used and how it can benefit your S.O.E.P.

JOB SHEET 2

WIRING SINGLE-POLE SWITCH AND KEYLESS LAMPHOLDER

OBJECTIVE:

1. To be able to identify selected electrical items and tools correctly.

2. To be able to diagram a keyless lampholder controlled by a single-pole switch correctly.

3. To demonstrate how to wire a switched keyless lampholder properly.

MATERIALS:

1. 3 pieces of ½-inch thinwall conduit
2. indoor conductors of proper length and colors
3. 1 four-inch octagon box
4. 1 handy box
5. 1 porcelain keyless lampholder
6. 1 single-pole switch
7. 1 handy box cover for toggle switch
8. 4 connectors for ½-inch thinwall conduit
9. electrical tools (screw driver, wire cutters, needle-nose pliers)

PROCEDURE:

1. In order to service horticulture implements after dark, a light is needed above the door of a small tool shed. The switch is to be mounted beside the door. There will be an unswitched line in at the switch and out at the light.

2. Properly diagram this exercise using pictorial or schematic symbols.

3. Select proper electrical tools and equipment needed for this exercise.

4. Complete exercise but leave covers off switch and lampholder until instructor inspects wiring and connections. After approval, finish exercise and let instructor test it for proper operation.

QUESTIONS:

1. How many wires can be safely contained in a handy box?

2. How can you distinguish between a single-pole switch and a 3-way switch?

3. What color of wires did you attach to each of the terminals?

4. What changes would you have to make if this was used out-of-doors?

OBSERVATIONS:

What special tools, skills, and information were used or learned by observing or demonstrating this exercise? What safety precautions did you observe?

APPLICATIONS:

Name or describe some situations where this skill could be used and how it can benefit your S.O.E.P.

JOB SHEET 3

WIRING A SPLIT-DUPLEX RECEPTACLE CONTROLLED AT TWO LOCATIONS

OBJECTIVES:

1. To be able to identify selected electrical items and tools correctly.

2. To be able to diagram a duplex receptacle correctly with one outlet switched and the other unswitched with the unswitched line located between the switches and receptacle.

3. To demonstrate how to wire a split-duplex receptacle properly within standards established by National Electrical Code.

MATERIALS:

1. 4 pieces of NM cable with ground
2. 1 four-inch square box
3. 1 four-inch square blank cover
4. 1 conduit switch box 3½-inches deep
5. 2 conduit switch boxes 2½-inches deep
6. 2 three-way switches
7. 2 bakelite wall plates for toggle switches
8. 1 split grounding-type duplex receptacle
9. 1 bakelite wall plate for duplex receptacle
10. 6 cable connectors
11. electrical tools (screw driver, wire cutters, wire strippers, needle-nosed pliers)

PROCEDURES:

1. A duplex receptacle is needed in the living room that will have one outlet (for a television receiver) unswitched and the other outlet (for a floor lamp) controlled by switches mounted in the wall next to the doors.

2. Properly diagram this exercise using pictorial or schematic symbols.

3. Select proper electrical tools and equipment needed for this exercise.

4. Complete exercise but leave covers off receptacle until instructor inspects wiring and connections. After approval, finish exercise and let instructor test it for proper operation.

QUESTIONS:

1. How many wires does the National Electrical Code allow in a four-inch square box?

2. How did wiring with cable affect the choice of wire colors to use in a hot line?

3. What type and size of cable did you use for this exercise? What does each number and letter mean on the cable?

4. How were the three-way switches connected to each other? What happened if the hot line to the switches was connected to one of the other terminals?

OBSERVATIONS:

What special tools, skills, and information were used or learned by observing or demonstrating this exercise? What safety precautions did you observe?

APPLICATIONS:

Name or describe some situations where this skill could be used and how it can benefit your S.O.E.P.

JOB SHEET 4

INSPECTING ELECTRIC MOTORS

OBJECTIVES:

1. To be able to identify various types and sizes of electric motors.

2. To be able to interpret nameplate information.

3. To be able to explain or demonstrate how to reverse an electric motor.

MATERIALS:

1. D. C. ammeter test set
2. 1 split-phase motor, capacitor-start motor, and repulsion-start motor

PROCEDURE:

1. Record the following nameplate information on an electric motor.

H.P.	____	Cycles	____
R.P.M.	____	Phase	____
Volts	____	____	
Amps.	____	____	

2. Identify the type of electric motors in the greenhouse. Give the size, voltage, and the equipment on which each is found.

3. Locate instructions on an electric motor explaining how to reverse it. Perform the skill according to directions. Be certain the power source is disconnected.

QUESTIONS:

1. Did this motor have a thermal over-load protector? If so, what was the rating?

2. How many wires were found coming out from the motor? What were they attached to?

3. Can this motor be wired to operate on both 120 and 240 volts? How?

4. What type of bearings does this motor have?

5. Will reversing the line-in wires reverse the motor? Why or why not?

6. How should electric motors be serviced?

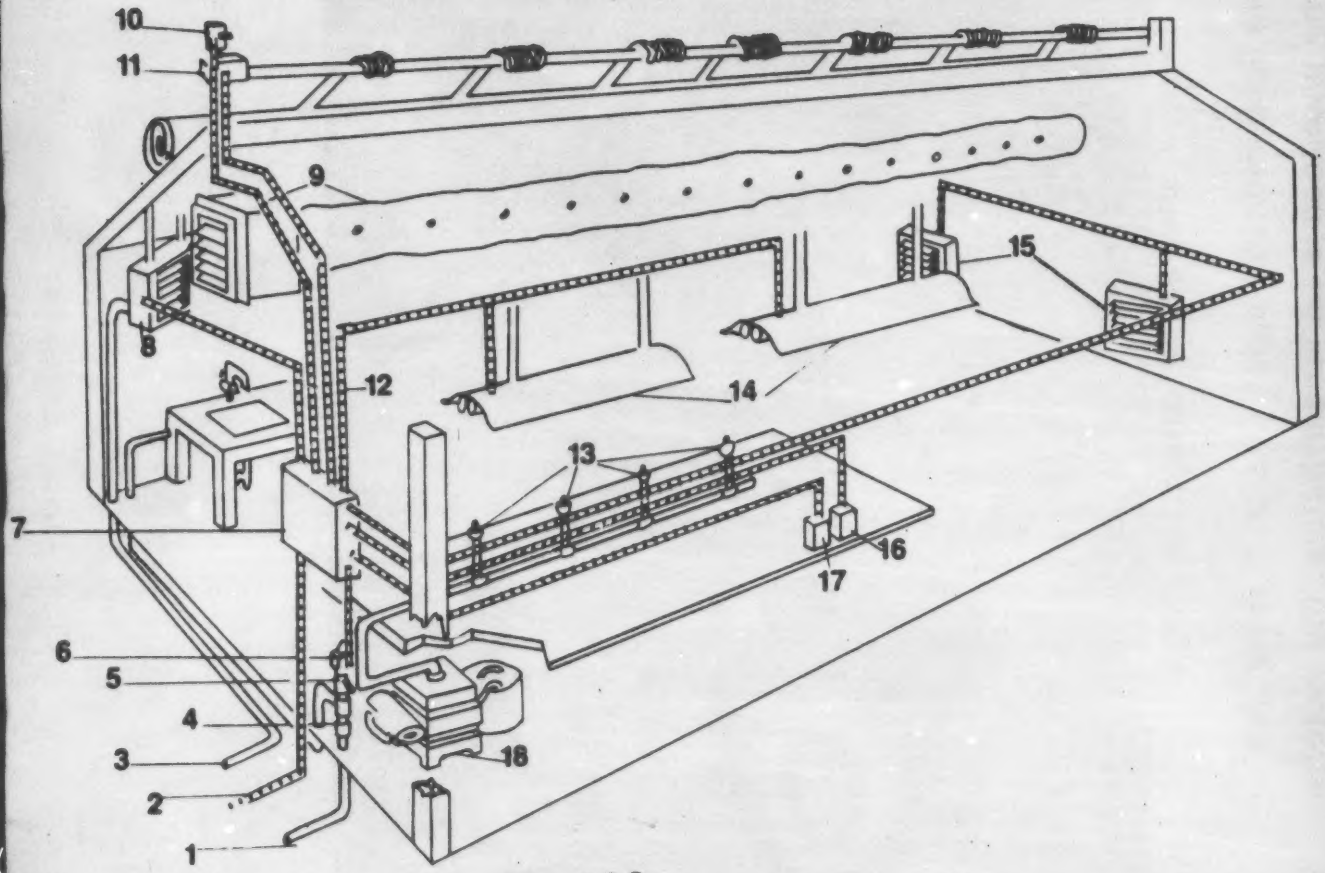
OBSERVATIONS:

What special tools were used, skills developed, and information learned by observing or demonstrating this exercise? What safety precautions did you observe?

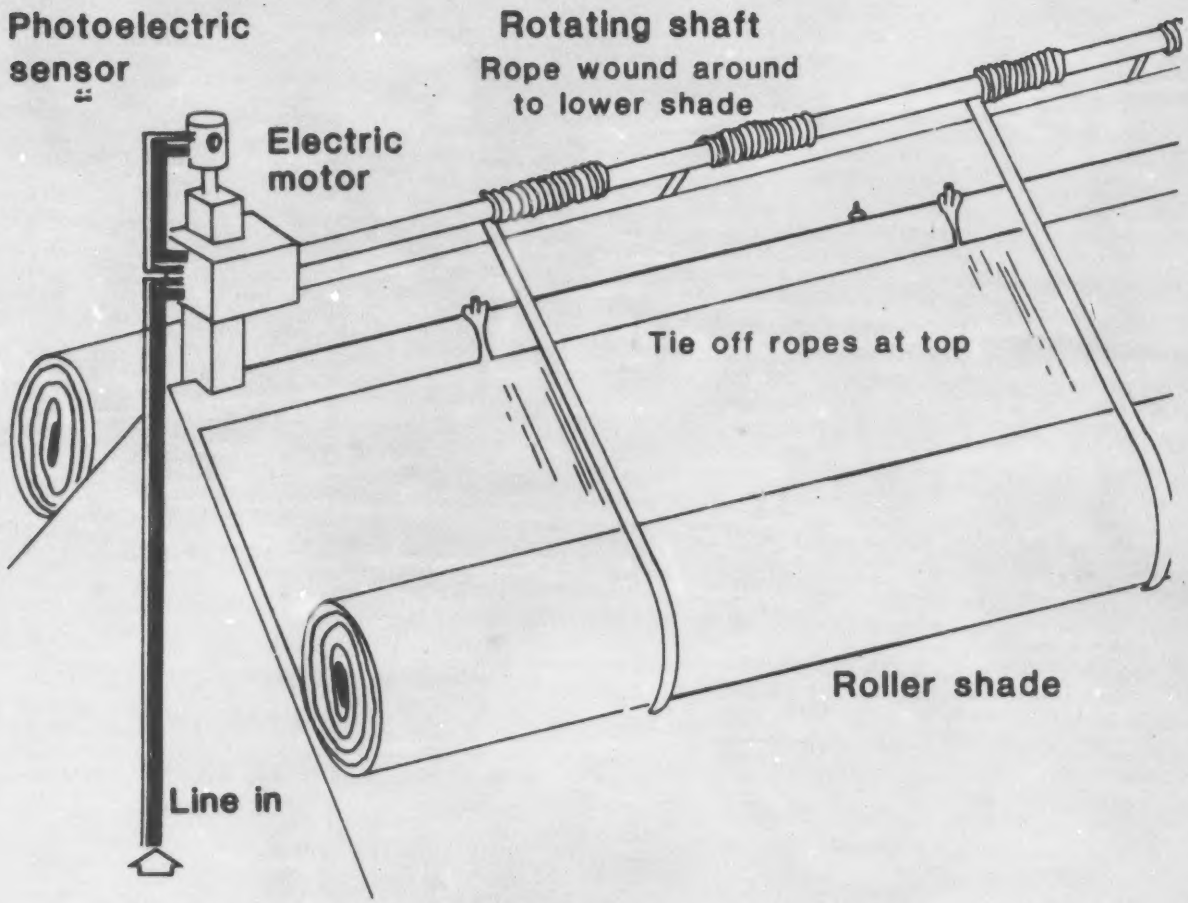
APPLICATIONS:

Name or describe some situations where this skill could be used and how it can benefit your S.O.E.P.

AUTOMATIC GREENHOUSE SYSTEMS



AUTOMATIC SHADING SYSTEM

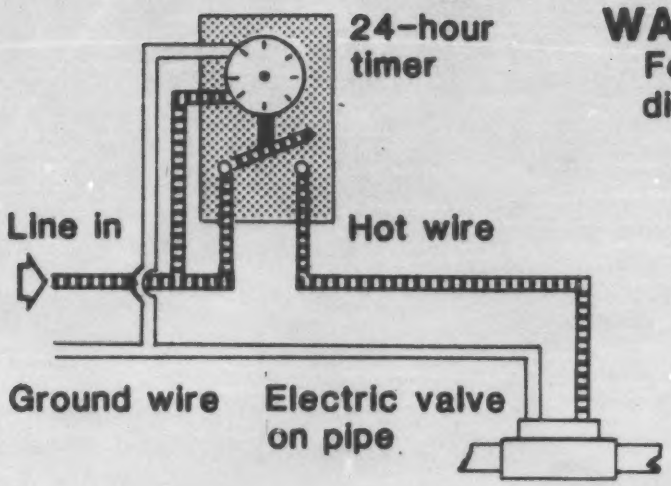


1. Wiring should be done to meet N.E.C. and local codes

2. When the light reaches a specified high intensity, the photo cell activates a small electric motor that lets the shade roll down. A limit switch stops the motor.

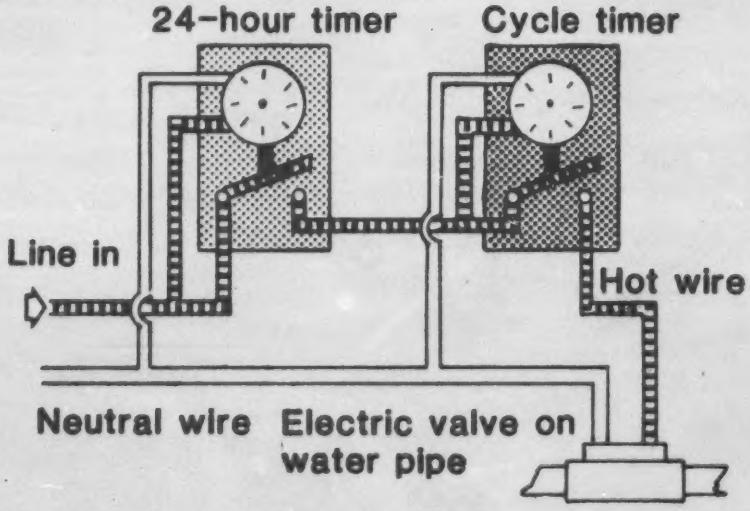
3. When the light intensity drops , as on a rainy day or evening, the photocell is no longer active, the motor is activated, and the shade is rolled back up.

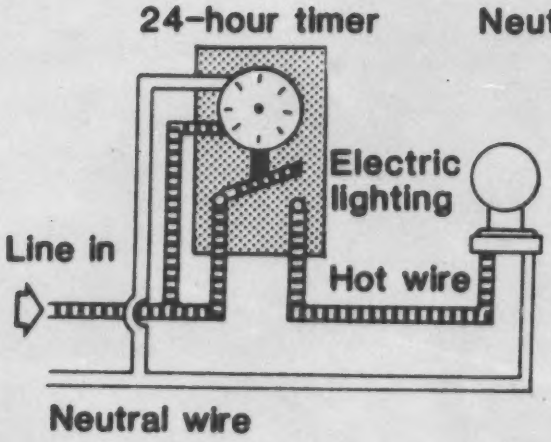
AUTOMATIC SYSTEMS WITH ELECTRIC TIMERS



WATERING
For all kinds of distribution systems

MISTING
For all types of misting devices

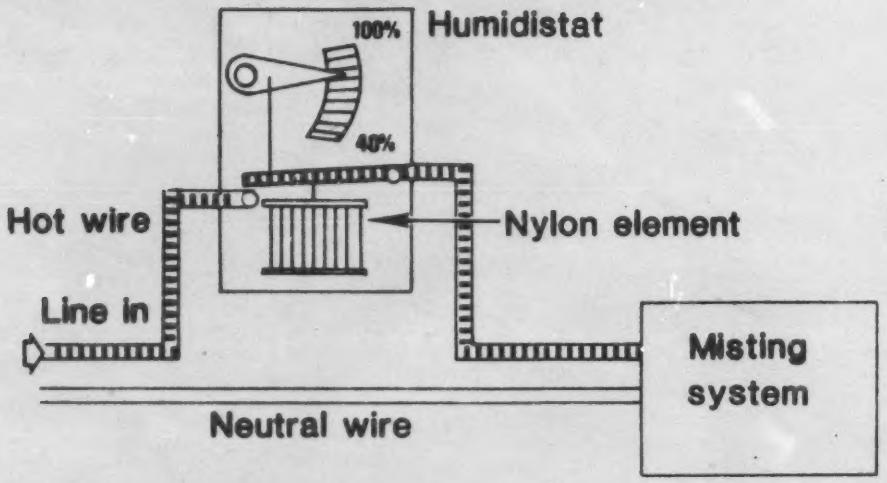




LIGHTING
For all kinds of lighting

AUTOMATIC SYSTEM FOR WATER

AUTOMATIC CONTROL WITH HUMIDISTAT



1. Dial is pre-set at desired humidity

2. When the air dries the nylon element contracts to close the circuit and turn on the humidifier or mist system

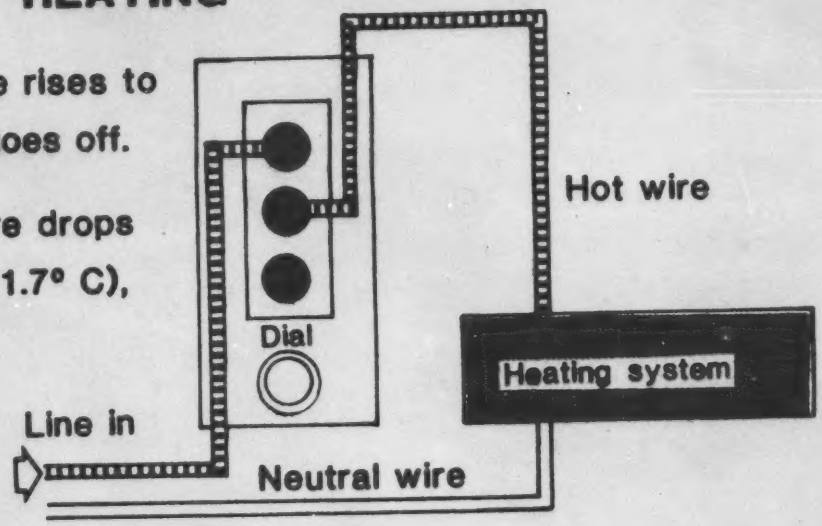
3. When the mist goes on, it wets the nylon element, which expands to shut off the system

AUTOMATIC SYSTEM WITH SINGLE STAGE THERMOSTATS

SINGLE-STAGE THERMOSTAT: HEATING

1 When temperature rises to dial setting, heater goes off.

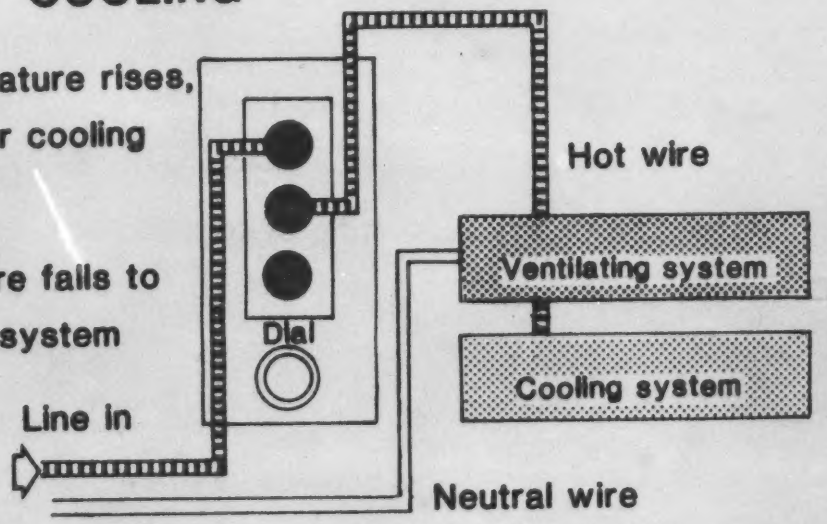
2. When temperature drops approximately 3° F(1.7° C), heater goes on.



SINGLE-STAGE THERMOSTAT: COOLING

1. When the temperature rises, the ventilating and/or cooling system go on.

2. When temperature falls to dial setting, cooling system goes off.



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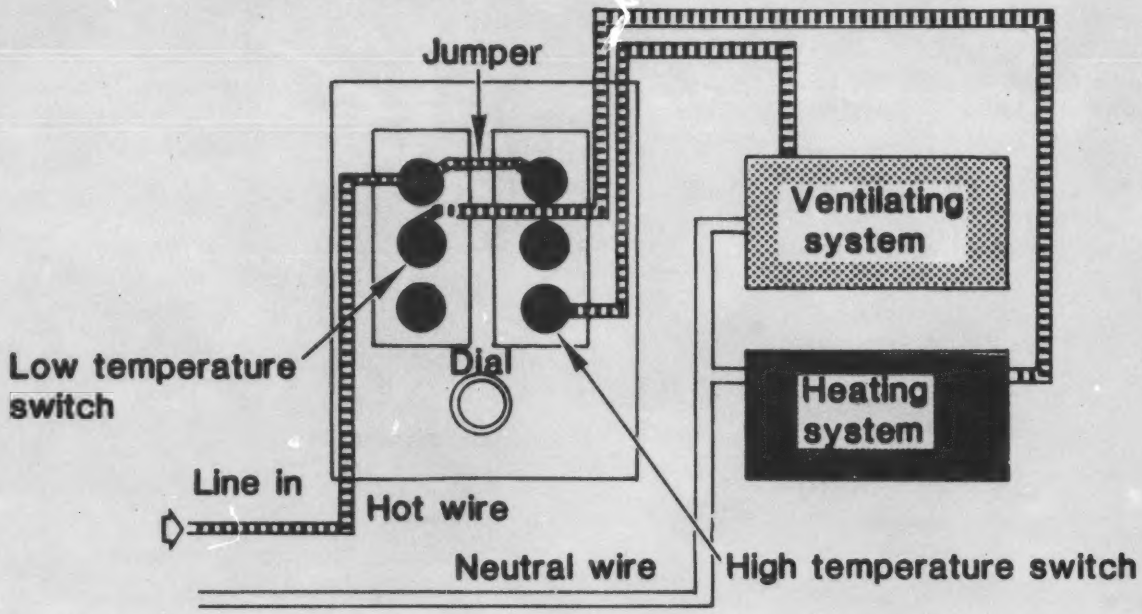
AUTOMATIC SYSTEM WITH TWO-STAGE THERMOSTAT

TWO-STAGE THERMOSTAT :

Heating and cooling systems

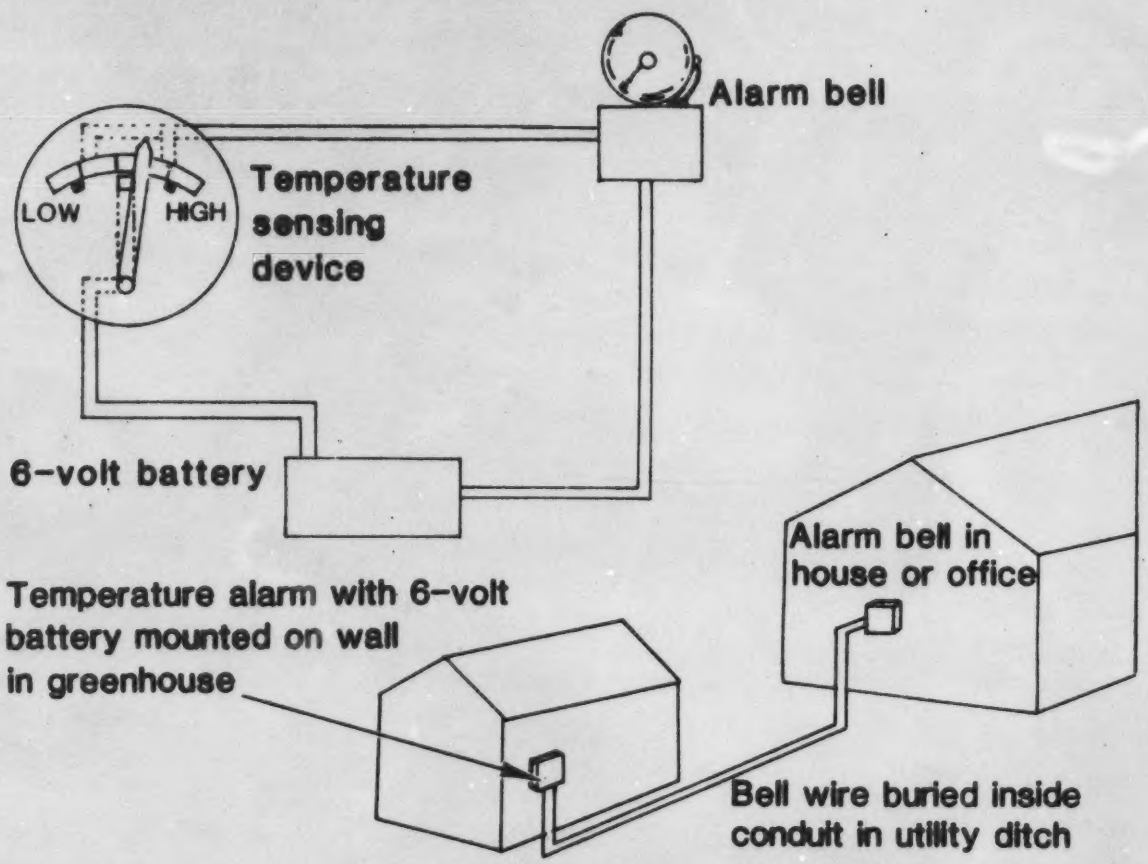


1. When temperature increases to dial setting, the heating system turns off

2. A further temperature increase of 3° F(1.7° C)will turn on the fan or the ventilating system

AUTOMATIC TEMPERATURE ALARM SYSTEM

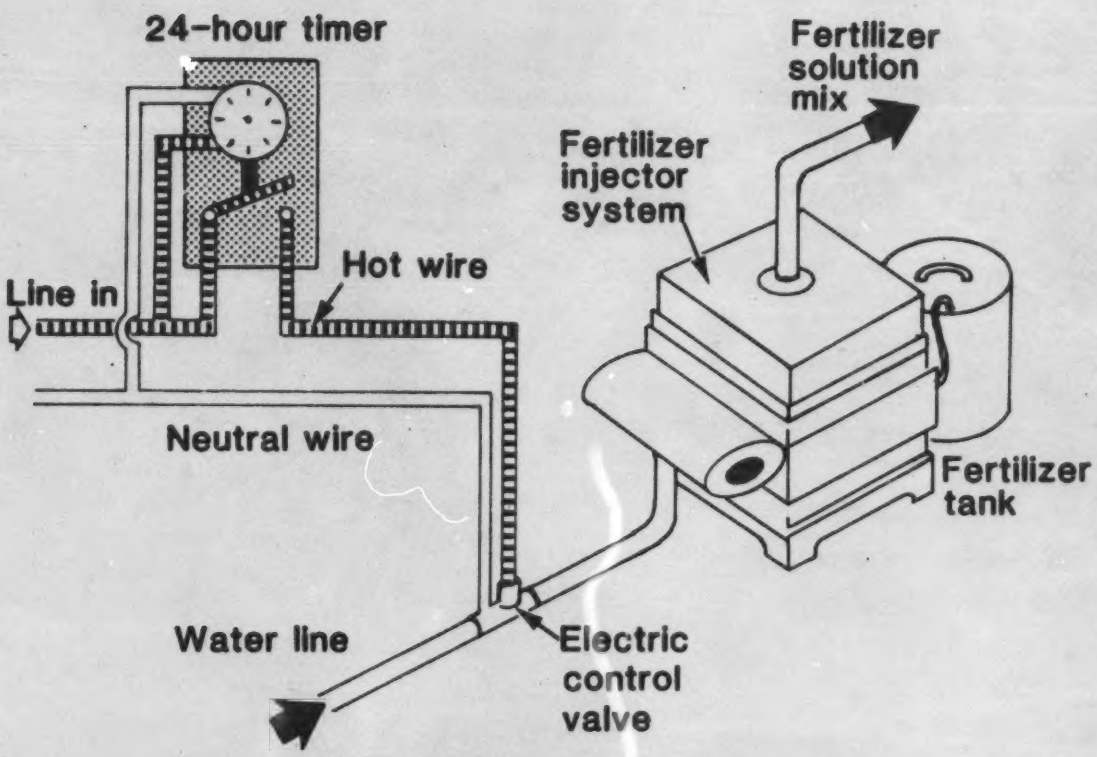
TEMPERATURE ALARM Wiring diagram



1. Temperature alarms that operate on battery power are available to set off an alarm system automatically at a pre-set temperature level

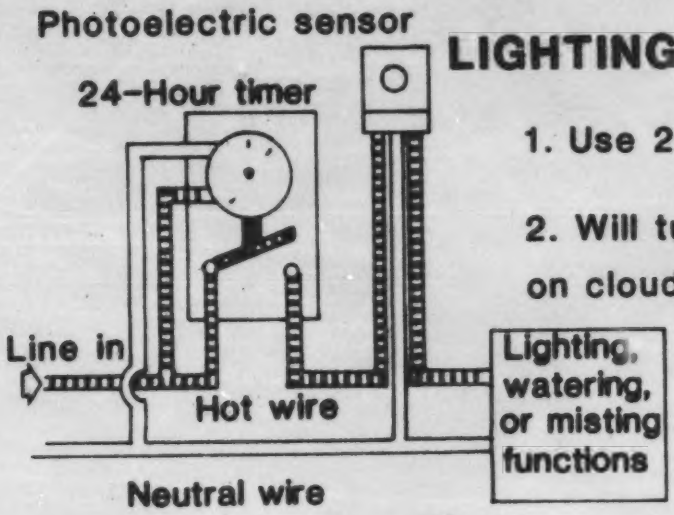
2. Operation when temperature gets too low or too high as set on the temperature alarm, the bell rings

AUTOMATIC SYSTEM FOR NUTRIENTS



Fertilizing with soluble fertilizer through the watering system

AUTOMATIC SYSTEM USING PHOTOELECTRIC CELL AND TIMER



LIGHTING

1. Use 24-hour clock

2. Will turn lights on at evening or on cloudy days and keep them on as long as the clock commands

WATERING

1. Use 24-hour timer

2. Will turn water on only when bright and sunny, applying water when the clock commands

3. Will not water on rainy days

MISTING

1. Use cycle timer

2. Will mist only when bright and sunny at intervals and duration as programmed on cycle timer

3. Will not mist on cloudy, rainy days

M-II-D-2-31

TRANSPARENCY DISCUSSION GUIDE

UNDERSTANDING ELECTRICAL CONTROLS

I. Transparency: AUTOMATIC GREENHOUSE SYSTEMS

A. Have students identify the numbered items on the transparency which make up different greenhouse systems. Briefly discuss the functions of each.

1. Water supply line
2. Electrical supply line
3. Gas supply line
4. Main water shut-off valve
5. Water line strainers
6. Automatic water supply valve
7. Main electrical fuse box
8. Unit heater system
9. Fan and perforated polyethylene tube
10. Photoelectric cell sensor
11. Shade roller system
12. Electrical cable
13. Mist system
14. Fluorescent lighting system
15. Louvered ventilating fan system
16. Humidistat sensor box
17. Thermostat sensor box
18. Fertilizer injector system

II. Transparency: AUTOMATIC SHADING SYSTEM

A. Ask students why this system is not commonly used in Illinois.

B. Point out different situations where photoelectric cells can be used. (i.e., turn on outside lights, turn on or off supplemental plant lighting, etc.)

III. Transparency: AUTOMATIC SYSTEM WITH ELECTRIC TIMERS

A. Have students identify where these can be used in a greenhouse.

B. Point out that these devices are useful in starting and stopping motors where a timed sequence is needed.

C. Examine a clock timer and let students become familiar with how to properly set it on a 24-hour cycle.

IV. Transparency: AUTOMATIC SYSTEMS FOR WATER

A. Point out that different sensing elements can be used (i.e. - human hair)

B. Point out that humidistats can also be used to turn on and off ventilating fans.

C. Discuss the type of humidistat used in your school greenhouse.

D. Discuss the point to consider in determining where humidistats should be located in a greenhouse.

V. Transparencies: AUTOMATIC SYSTEM WITH SINGLE-STAGE THERMOSTATS, AUTOMATIC SYSTEM WITH TWO-STAGE THERMOSTAT, AND AUTOMATIC TEMPERATURE ALARM SYSTEM

A. Discuss the common type of thermostats used in greenhouses.

B. Identify the type of thermostat used in your local greenhouse.

C. Discuss the points to consider in determining where thermostats should be located in a greenhouse.

D. Discuss why temperature alarm systems are important for greenhouse environment control.

VI. Transparency: AUTOMATIC SYSTEM FOR NUTRIENTS

A. Point out that fertilizer can be controlled by one timer and the water mist system by another.

B. Discuss the type of fertilizing system used in your greenhouse.

VII. Transparency: AUTOMATIC SYSTEM USING PHOTOELECTRIC CELL AND TIMER

A. Point out that this system is connected in series. Both must be closed before systems will operate.

B. Point out that the systems could be connected in parallel. Then if either switch closed, the system would operate.

C. Discuss how your local greenhouse uses automatic controls connected in series and parallel.

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

ELECTRICAL SAFETY AND FUNDAMENTALS

1. Define an electric current.

   The flow of electrons through a conductor.

2. What is voltage?

   The pressure that causes electrons to flow through a conductor.

3. What are the common voltages used for heat, light and power?

   120, 240

4. What apparatus is used to step electric voltage up or down?

   Transformers

5. Voltage is measured with what?

   Voltmeter

6. How is this instrument connected in the circuit?

   It is connected across two wires of the circuit and measures the difference in electrical pressure between them.

7. What is amperage?

   The rate of flow of electricity.

8. What instrument is used to measure amperage?

   Ammeter

9. How does the amperage measuring device work?

   The ammeter is attached in one line to measure all of the electrons that pass a certain point in a given length of time.

10. All materials used should be approved by what agency?

    Underwriters Laboratory

11. Define a watt.

    A watt is the power delivered by one ampere of current flowing at a pressure of one volt.

12. Write an equation that shows the relationship of volts, amps and watts.

volts x amps = watts

13. What is another word to describe resistance? Friction

14. What unit is used to measure resistance? Ohms

15. Name two materials that have high resistance and two that have low resistance.

High - Glass, Rubber
Low - Copper, Aluminum

16. If you are using 120 volt electricity and wattage is 270, what is the amperage?

$$\text{amps} = \frac{\text{watts}}{\text{volts}} \qquad \text{amps} = \frac{270}{120} = \underline{2.25}$$

17. Write the equation that shows the relationship between current, voltage, and resistance. Volts = amps x ohms

18. What is the resistance of a circuit that has a voltage of 240 and an amperage of 3.5?

$$\text{ohms} = \frac{\text{volts}}{\text{amps}} \qquad \text{ohms} = \frac{240}{3.5} = \underline{68 \text{ ohms}}$$

19. What is the wattage of a circuit that has 240 volts and 5 amps?

watts = amps x volts watts = 5 x 240 = 1200

20. What is the amperage of a circuit that has a voltage of 120 and a resistance of 40 ohms?

$$\text{amps} = \frac{\text{volts}}{\text{ohms}} \qquad \text{amps} = \frac{120}{40} = 3$$

21. When should one use ground-fault circuit interruptors.

22. Name 8 of the electrical materials and devices you identified in the greenhouse lab.

23. What information is found on the nameplace of an electric motor?

24. Explain the workings of one of the electrical controls in your greenhouse lab.

25. Name 8 things that are important for safety in the greenhouse.

26. Optional - What are some questions about electricity and electric motors that have been raised in your mind because of the study of this lesson?

UNIT D: HORTICULTURAL/AGRICULTURAL MECHANICS

PROBLEM AREA: SERVICING SMALL GAS ENGINES

SUGGESTIONS TO THE TEACHER:

This problem area is designed to be used with second-year students enrolled in horticulture/agriculture programs. The recommended time for teaching this problem area is 5 to 10 days depending on how much time the teacher wishes to spend on discussion and conducting the suggested exercises. The materials in this problem area were selected and written with the following assumptions:

1. No prior experience with small engines is required for students.

2. Teaching engine overhaul is not an objective of the problem area. This would be an excellent lead-in problem area to overhaul.

3. No special tools or large shop area is needed to perform the suggested tasks. (Note a few minor tools are needed. Check suggested learning activities list.)

The instructor is encouraged to conduct a local search to locate other supplementary materials. The items in this problem area are for reference or modification as the teacher adapts these materials to his/her local situation. Instructional materials should be ordered and engines should be obtained or located prior to the time instruction is to begin.

CREDIT SOURCES:

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The teacher's guide, worksheets, job sheets, and sample test questions were developed by Allen Dietz, Vocational Agriculture Instructor, Sycamore High School, Sycamore, Illinois and Jerry Pepple, Department of Vocational and Technical Education, University of Illinois. Transparencies were prepared by Vocational Agriculture Service, University of Illinois. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Field Test Teachers.

TEACHER'S GUIDE

I. Unit: Horticultural/agricultural mechanics

II. Problem area: Servicing small gas engines

III. Objectives: At the close of the problem area students will be able to:

1. Identify the uses and types of small engines.

2. Properly service and maintain small engines for use at home or on the job.

3. Explain the principles of operation of small engines.

4. Observe proper safety procedures while working with small engines and identify and use safety devices installed on small engines.

IV. Suggested interest approaches:

1. Have one engine in the classroom prior to class arriving. Make sure the engine runs. Turn off engine and turn carburetor needle valve one turn out. When class begins, show students that engine will not start and ask if they know why. Reset the carburetor and start the engine.

2. Ask students how each of them use small engines in their everyday life.

3. Ask students to bring in their own lawnmowers, etc. so they will be able to tune them for use at home.

V. Anticipated problems and concerns of students:

1. What are the uses of small engines in horticulture/agriculture?

2. How does a small engine operate?

3. What safety rules do I need to know when working with small engines?

4. How do I service and set the carburetor?

5. How do I service the air intake system?

6. How do I service the lubrication system?

7. How do I service and set the ignition system?

8. How do I trouble-shoot a small engine?

9. What is the difference between a 4-cycle and a 2-cycle engine?

10. How do I service a small engine for off-season storage?

VI. Suggested learning activities and experiences:

1. Discuss the problems and concerns identified by class or teacher when first starting problem area.

2. Discuss possible uses of small engines in the horticulture/agriculture industry.

3. Visit a lawn and garden center that sells small engines and equipment (lawnmowers, snowblowers, roto-tillers, weed eaters, etc.). Have dealer discuss the business with careers available, etc.

4. Have class read VAS Unit #3014, "Small Engines-Principles of Operation, Trouble Shooting, and Tune-up." Distribute and have students complete Worksheet 1.

5. Have class read VAS Unit 3020 "The Two-Cycle Engine." Distribute and have students complete Worksheet 2.

6. Have class read Briggs & Stratton "General Theories of Operation." Conduct class discussion and problem solving on theories of operation.

7. Have class read selected pages of AAVIM "Operating Tractors for Groundskeeping and Ornamental Horticulture." Conduct demonstration on selected groundskeeping equipment.

8. Discuss safety features on lawnmowers and point out examples. Also, use VAS Slidefilm "Using Power Mowers Safely."

9. Discuss how small engines operate using VAS Transparencies.

10. Discuss regular small engine maintenance using VAS Transparencies.

11. Discuss off-season storage of small engines using VAS Transparencies.

12. Discuss how to service and set the carburetor using VAS Transparencies Carburetion.

13. Using selected job sheets, have students service and set small engine. These could be ones owned or purchased by the school or brought in by students from home. (Needed tools-feeler guage, screwdriver, and mechanics wrenches.)

14. Using Worksheets 3 and 4, have students obtain specifications from proper manuals. Have students check specifications against actual settings.

15. Before class begins, change carburetor setting, or spark plug gap, etc. and have students, using VAS Trouble Shooting Transparencies, trouble shoot engine in an attempt to get it running again.

VII. Evaluation:

1. Prepare and administer a pencil and paper test on material covered in class. Use sample test questions included in this problem area.

2. Give lab practical test on servicing a specific part or parts of a small engine.

3. Grade worksheets and job sheet students performed working with engines.

VIII. References and aids:

1. Vocational Agriculture Service, University of Illinois, Subject Matter Unit 3014, "Small Engines-Principles of Operation, Trouble Shooting, and Tune-up," Vocational Agriculture Service, University of Illinois.

2. Vocational Agriculture Service, University of Illinois, Subject Matter Unit 3020 "Two-Cycle Engine", Vocational Agriculture Service, University of Illinois.

3. Vocational Agriculture Service, University of Illinois, Small Engine Transparencies.

4. Vocational Agriculture Service, University of Illinois Slidefilm #498 "Using Power Mowers Safely," Vocational Agriculture Service, University of Illinois.

5. Midwest Engine Warehouse
515 Romans Road (Regional Dealership for Briggs & Stratton)
Elmhurst, IL 60126
Phone-312/833-1200

   A. "General Theories of Operation" Briggs & Stratton Corporation, Milwaukee, Wisconsin.

   B. "Repair Instruction IV" Briggs & Stratton Corporation, Milwaukee, Wisconsin.

   C. Small Engine Fiip Chart-Briggs & Stratton Corporation, Milwaukee, Wisconsin 53201.

Note: The above Briggs and Stration Materials can be ordered through Midwest Engine Warehouse. Any school offering a small engine course can receive enough copies of "General Theories of Operation" and "Repair Instruction IV" manuals for the entire class plus one flip chart and one engine free of charge. Additional engines, parts, and tools can be purchased through them at a reduced educational discount price.

6. Publication #202, "Operating Groundskeeping Tractors" AAVIM, 120 Driftmeier Engineering Center, Athens, Georgia 30602.

7. Student worksheets and job sheets.

8. Sample test questions.

STUDENT WORKSHEET 1

SMALL ENGINES-OPERATION, TROUBLE SHOOTING AND TUNE-UP

(Refer to VAS Unit 3014)

1. Four-stroke cycle engines make _____ revolution(s) of the crankshaft for each power stroke of the piston.

2. Two-stroke cycle engines make _____ revolution(s) of the crankshaft for each power stroke of the piston.

3. The four distinct strokes for one complete cycle are _____, _____, _____, and _____.

4. Three primary essentials for the operation of an internal combustion engine are _____, _____, and _____.

5. The true sealing between the piston and cylinder walls is done by _____.

6. Upper rings are solid and are called _____ and the bottom ring is perforated and is called an _____.

7. A comparison between the volume of the cylinder when the piston is at the bottom of its stroke and the volume of the cylinder when it is at the top of its stroke is called the _____.

8. The functions of the carburetion system are to _____, _____, _____, _____.

9. The parts of the fuel system include _____, _____, _____, and _____.

10. Speed control is provided by placing a flat disc in the throat above the _____.

11. Two common types of governors are the _____ and _____.

12. Starting a cold engine requires a richer fuel mixture which is accomplished by closing a second "butterfly" called a _____.

13. Three types of air cleaners used on small engines are _____, _____, and _____.

14. Small engines generally use _____ as a source of energy to produce electric spark.

15. The ends of the primary coil windings are connected to the _____ and the ends of the secondary coal windings are connected to the _____.

16. Most small engines are _____ cooled rather than liquid cooled.

17. The four-cycle engine is lubricated from a supply of oil in the _____

18. Low compression in small engines is generally a result of worn _____ or _____.

19. The fundamental principle of trouble shooting is to check _____.

20. If compression is satisfactory, the next thing to check is the _____.

21. A plugged _____ can cause an engine to flood.

22. The ignition system can be checked by removing the spark plug and observing the type of spark which occurs between the _____ of the plug at regular intervals in the cycle.

23. When adjusting the carburetor during the final tune-up, set the _____ adjustment first, the _____ second, and _____ last.

STUDENT WORKSHEET 2

THE TWO-CYCLE ENGINE

(Refer to VAS Unit 3020)

1. The two-cycle engine uses its _____ as a fuel mixture transfer pump.

2. The two types of valves on two-cycle engines are ____ and _____.

3. Lubrication of two-cycle engines depends on adding _____ to the gasoline.

4. The eight things which should be checked on the ignition system are;

   a.

   b.

   c.

   d.

   e.

   f.

   g.

   h.

5. The six things which should be checked on the fuel system are:

   a.

   b.

   c.

   d.

   e.

   f.

6. The three things which should be checked for loss of power are:

   a.

   b.

   c.

STUDENT WORKSHEET 3

FOUR-CYCLE ENGINE SPECIFICATIONS

(Refer to owner/operator manual and small engine)

1. Name of motor _____
2. Serial number _____
3. Model number _____
4. Idle R.P.M. _____
5. High speed R.P.M. _____
6. Crankshaft - vertical or horizontal _____
7. Piston - vertical or horizontal _____
8. Type of lubrication system _____
9. Engine horsepower _____
10. Diameter of cylinder _____
11. Length of stroke _____
12. Spark plug gap _____
13. Point gap _____
14. Condensor capacity _____
15. Flywheel air gap _____
16. Type of oil recommended in summer _____
    in winter _____
17. Type of carburetor _____
18. Type of governor _____
19. Type of air cleaner _____
20. Type of starting mechanism _____

STUDENT WORKSHEET 4

TWO-CYCLE ENGINE SPECIFICATION

(Refer to owner/operator manual and small engine)

1. Make of engine _____
2. Model number _____
3. Serial number _____
4. Grade of gasoline recommended _____
5. Type of oil recommended _____
6. Break point gap _____
7. Type (size) of spark plug _____
8. Spark plug gap _____
9. Type of carburetor _____
10. Type of air cleaner _____
11. High speed R.P.M. _____
12. Type of choke system _____
13. Armature air gap _____

JOB SHEET 1

SERVICING CYLINDER BLOCK AND ACCESSORIES

I. Objectives:

A. To develop skills and knowledge cleaning and inspecting external parts of small engines.

B. To be able to identify and explain the functions of selected small engine parts and accessories.

II. Materials Needed:

A. Mechanics tools (screwdrivers, open-end and box-end wrenches, socket set).

B. Old paintbrush and wire brush.

C. Pressurized air.

D. Recommended cleaning solvent.

E. Catch pan for used cleaning solvent.

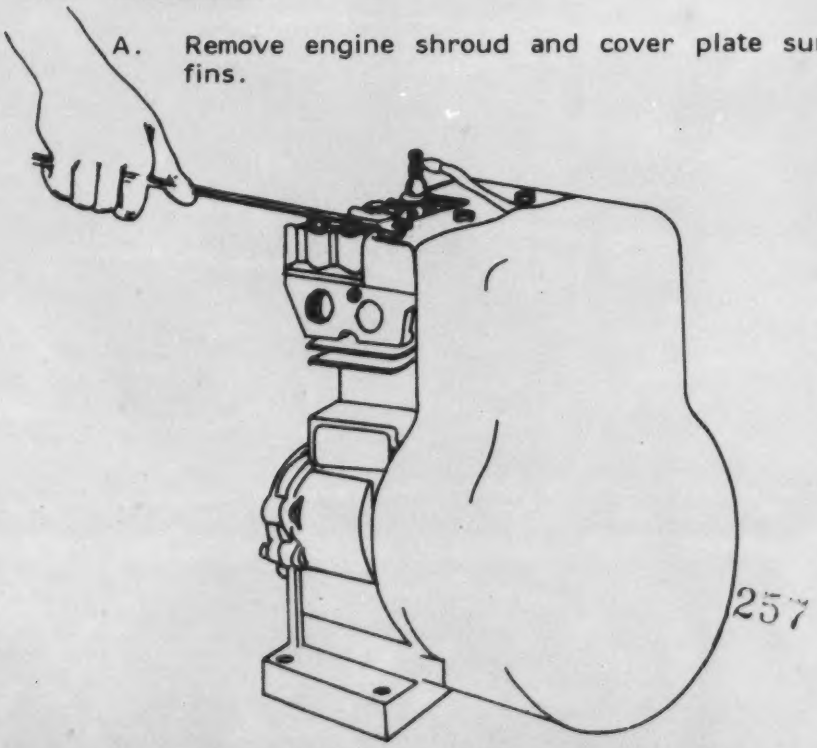
F. Parts scraper or putty knife.

G. Small engine - allow the engine to cool off if it has been running.

H. Clean shop rags.

III. Procedures:

A. Remove engine shroud and cover plate surrounding the engine fins.



B. Inspect engine parts for worn or broken items. Check for oil leaks and leaking gas.

C. Use old paintbrush or a dry parts-cleaning brush to remove loose dirt, etc.

D. Use pressurized air to remove dirt, etc. in hard-to-reach places. (safety glasses are a must for this)

E. Apply cleaning solvent (according to directions) on parts that need further cleaning.

F. Remove solvent from engine (read and follow directions on label)

G. Replace engine parts.

H. Start engine and check for proper operation.

IV. Questions:

A. What is the purpose of the engine shroud?

_____

_____

B. What is the purpose of the fins on the outside of the cylinder block and head?

_____

_____

C. When was this engine last cleaned?

_____

_____

D. How often should this type of servicing be done?

_____

_____

V. Observations:

Record the key knowledge and skills acquired by this exercise. How can these skills be used to improve your S.O.E.P.?

JOB SHEET #2

SERVICING AIR CLEANERS

I. Objectives:

A. To develop skills and knowledge in servicing air cleaners.

B. To be able to identify the three major types of small engine air cleaners.

II. Materials Needed:

A. Mechanics tools (screwdrivers, socket set).

B. Paint brush.

C. Putty knife or parts scraper.

D. Clean shop rags.

E. Recommended cleaning solvent.

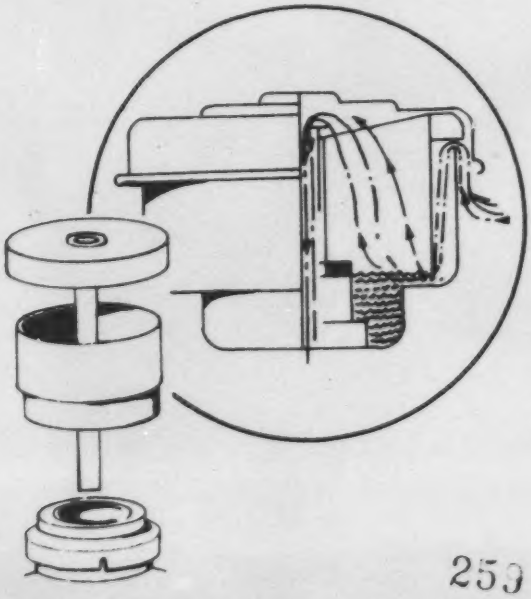
F. Catch pan for used cleaning solvent.

G. Small engine air cleaners (oil-bath, oiled-filter, and/or dry-filter type).

III. Procedures:

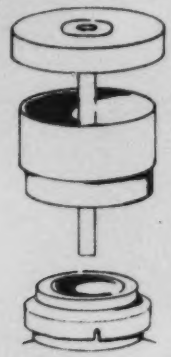
A. Identify the type of air cleaner to be serviced. Then, use appropriate procedure.

Oil-Bath Air Cleaner



A. Disconnect spark plug lead.

B. Remove oil cup cover and air cleaner from engine. Cover air-intake on small engine to prevent dirt from getting into small engine internal parts.



C. Check condition of air cleaner and amount of sediment in bottom of air cleaner. Discard old oil and sediment.

D. Clean cup and filter with recommended solvent.

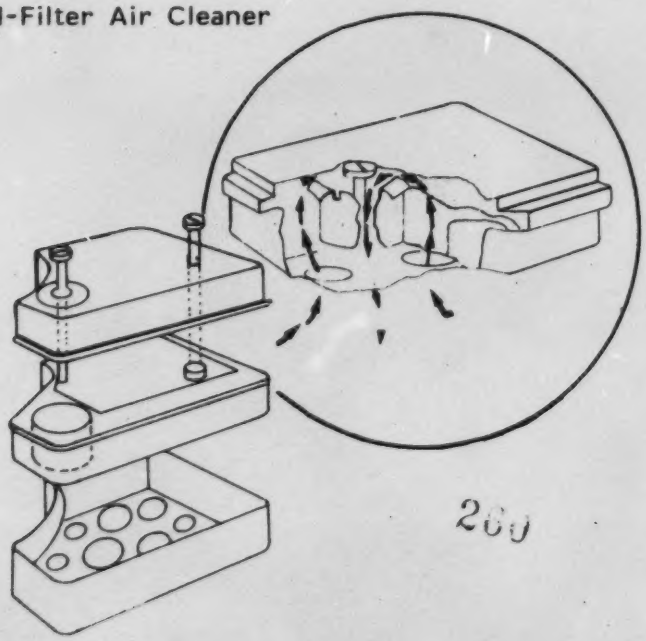
E. Dry air cleaner cup, cap, and filter using shop rags and pressurized air.

F. Refill oil cup to proper level with recommended oil type.

G. Remove cover from air intake system and replace serviced air cleaner system.

H. Reconnect spark plug lead and start engine.

Oiled-Filter Air Cleaner

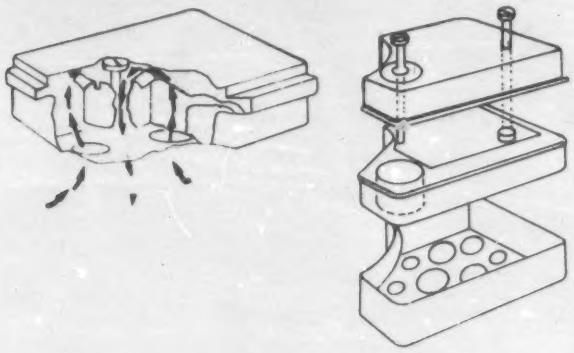


200

A. Disconnect spark plug lead.

B. Clean around air cleaner with brush and pressurized air.

C. Remove air filter cover and oiled-element.



D. Place a cover over air intake point to prevent dirt from entering small engine.

E. Clean filter and filter cover using recommended cleaning solvent.

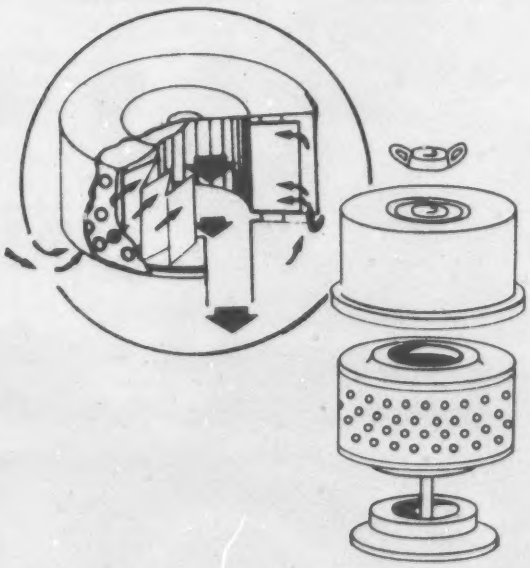
F. Dry air cleaner cover and filter using clean shop rags and pressurized air.

G. Place a few drops of oil on filter element and work oil into element.

H. Remove protective cover from air intake system and replace serviced air cleaner system.

I. Reconnect spark plug lead and start engine.

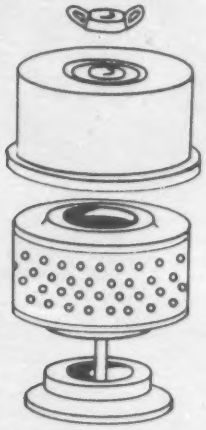
Dry-Filter Air Cleaner



A. Disconnect spark plug lead.

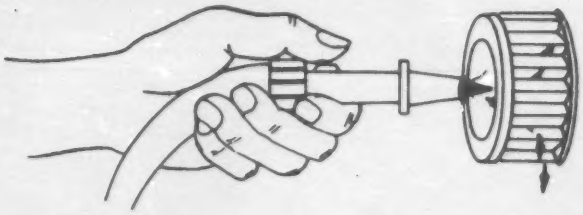
B. Clean area around air cleaner system with brush and pressurized air.

C. Remove air cleaner system from engine. Cover air-intake part with a protective cover to prevent dirt from getting into small engine internal parts.



D. Remove air cleaner cover from dry-filter element and inspect condition of element.

E. Try to clean element by tapping it on a flat clean surface. Use low pressure air blow from the inside of the element toward outside (reverse of normal air flow).



F. Hold element toward light source. If light is not easily visible through element discard it and replace it with a new one.

G. Remove protective cover from small engine air-intake system and replace serviced air cleaner system.

H. Reconnect spark plug lead and start engine.

IV. Questions:

A. What symptons result from having a plugged air cleaner?

_____

_____

B. Why should gasoline never be used to service or clean air cleaner systems?

_____

_____

C. When was this service last performed on this engine?

_____

_____

D. How often should the air cleaner be serviced on this engine?

_____

_____

V. Observations: How can these skills benefit your S.O.E.P.?

JOB SHEET #3

SERVICE IGNITION SYSTEMS

I. Objectives:

A. To develop skills and knowledge in servicing and inspecting small engine ignition systems.

B. To be able to identify and explain the functions of selected small engine ignition system parts.

II. Materials.

A. Mechanics tools (socket set, screwdrivers, wrenches, etc.).

B. Torque wrench (inch-pounds).

C. Feeler guage.

D. Old paint brush.

E. Soft hammer.

F. Flywheel holding tool.

G. Flywheel puller.

H. Specification manual.

I. New spark plug and ignition points and condensor.

J. Pressurized air.

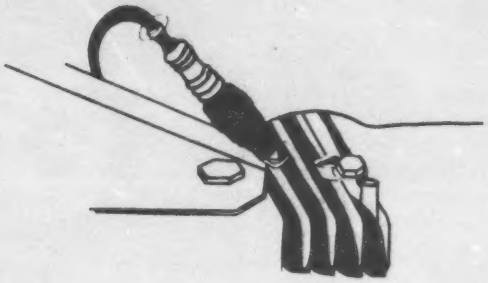
K. Clean shop rags.

III. Procedures:

A. Disconnect spark plug lead and loosen spark plug. Use pressurized air to remove dirt and trash from around spark plug.

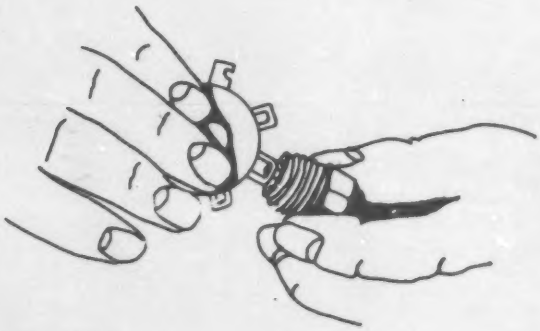
B. Check condition of plug (oil, carbon deposits, burning of electrodes, etc.)

C. Lay spark plug on engine head and reconnect lead wire. Crank engine and observe the type of spark. It should be blue and snap when firing.



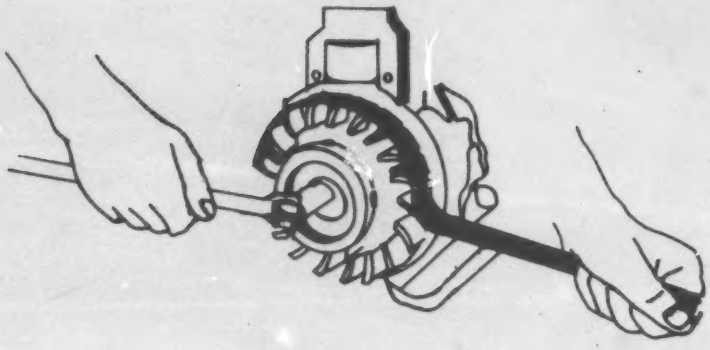
D. If spark plug electrodes are burnt and has severe deposits of carbon, replace it with a new plug. The time spent in cleaning used plugs will not be worth the cost of one new spark plug.

E. Check electrode gap of spark plug and compare with recommendations in specification manual. Use feeler guage to adjust if needed. Do not replace spark plug in engine head until ignition points are serviced.



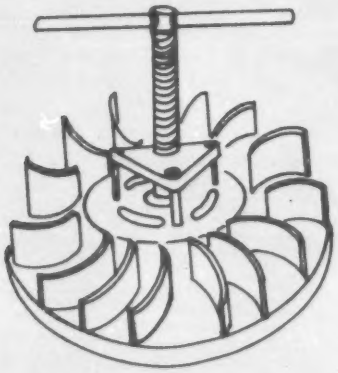
F. Remove flywheel shroud from engine.

G. Remove flywheel nut.

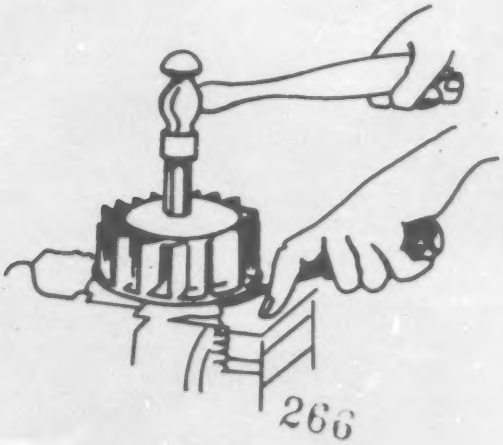


H. Remove flywheel by either:

1. Using flywheel puller tool.

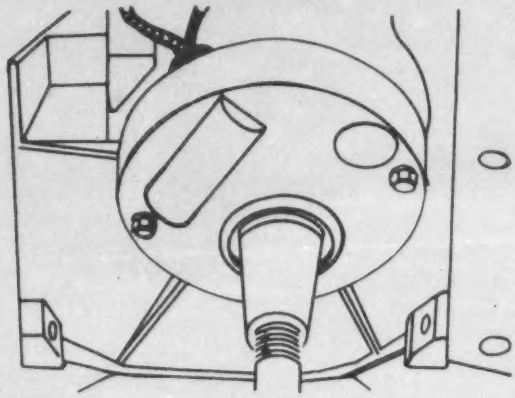


2. Using knock-off tool, pry bar, and hammer. This method should only be used on tapered shafts. Never pound directly on a flywheel.



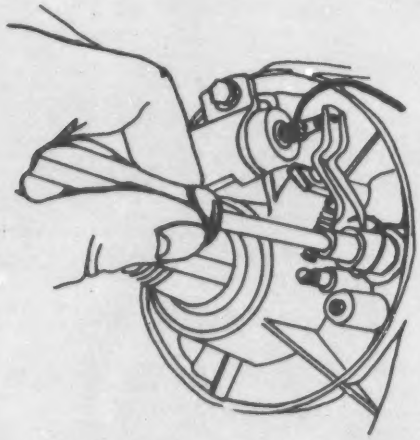
I. Clean engine flywheel and engine under the flywheel.

J. Remove ignition dust cover plate.



K. Make a sketch of how the ignition points and condensor are hooked-up.

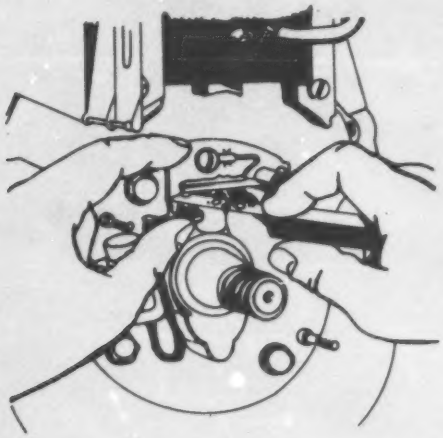
L. Remove ignition points and condensor.



M. Inspect points for wear or burning. Check oil seal for leak around crankshaft. Check condition of flywheel sheer key.

N. Install new ignition points and condensor, if needed.

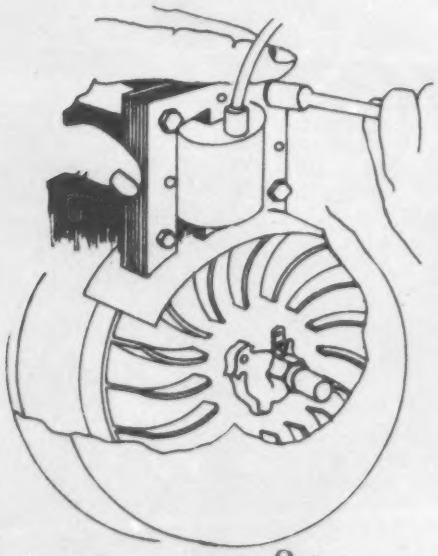
O. Rotate engine in direction of normal rotation until points open their widest. Adjust point gap using screwdriver and feeler guage. Set gap according to specification manual.



P. Tighten ignition points after setting and rotate engine to observe point operation. Check to see that contacts are properly aligning and re-check gap.

Q. Replace dust cover, flywheel (use a new sheer key), and flywheel nut. Tighten flywheel (using torque wrench) to proper specification.

R. Check and adjust magneto armature gap. Refer to specification manual. (A post card can be used to set this gap.)



S. Replace shroud and rewind starter assembly.

T. Replace spark plug and tighten according to specification manual.

U. Reconnect spark plug lead. Start engine.

IV. Questions:

A. What controlled or timed the spark at the plug?

_____

_____

B. What effect would improper gapping of the points have on engine timing?

_____

_____

C. Why should you not use a hard key in the flywheel?

_____

_____

D. What effect would a partially sheered flywheel key have on engine timing?

_____

_____

V. Observations: How can these skills be used to benefit your S.O.E.P.?

JOB SHEET #4

PREPARING SMALL ENGINES

FOR END-OF-SEASON STORAGE

I. Objective:

To be able to properly prepare small engines for off-season storage.

II. Materials Needed:

A. Mechanics tools (socket set, wrenches, screwdrivers)

B. Oil squirt can

C. Catch pan for used oil

D. Clean shop rags.

E. Pressurized air.

III. Procedure:

A. Drain fuel tank and start engine to remove excess fuel from carburetor system.

B. If engine is to be stored in a damp, cold location, close the valve on the fuel line (if one is used) and refill the tank with fuel. This will prevent the tank from rusting. This fuel should be discarded before starting the engine at the beginning of the next season.

C. Clean the engine according to Job Sheet #1, "Servicing the Cylinder Block and Accessories".

D. Remove the spark plug and squirt about ½ to 1 teaspoon of oil into cylinder. Rotate the crankshaft three or four times to coat the cylinder with oil. Replace spark plug.

E. Drain and refill engine crankcase on four cycle motor.

F. Service and clean air cleaner according to Job Sheet #2, "Servicing Air Cleaners".

G. Apply paint, oil, or grease to exposed unpainted surfaces to prevent rusting.

H. Cover engine with plastic and store inside building where it is not in contact with the ground.

IV. Questions:

A. What type and weight of oil should be used with small engines
for summer use?_____
for winter use?_____

B. How often should oil be changed in four-cycle engines?

_____

_____

C. If an engine will not start how would you proceed to determine the cause?

_____

_____

V. Observations: How can these skills be used to improve your S.O.E.P.?

TEACHER'S KEY

STUDENT WORKSHEET 1

SMALL ENGINES-OPERATION, TROUBLE SHOOTING AND TUNE-UP

(Refer to VAS Unit 3014)

1. Four-stroke cycle engines make two revolution(s) of the crankshaft for each power stroke of the piston.

2. Two-stroke cycle engines make one revolution(s) of the crankshaft for each power stroke of the piston.

3. The four distinct strokes for one complete cycle are intake, compression, power, and exhaust

4. Three primary essentials for the operation of an internal combustion engine are compression, carburetion, and ignition.

5. The true sealing between the piston and cylinder walls is done by piston rings.

6. Upper rings are solid and are called compression rings and the bottom ring is perforated and is called an oil ring.

7. A comparison between the volume of the cylinder when the piston is at the bottom of its stroke and the volume of the cylinder when it is at the top of its stroke is called the compression ratio.

8. The functions of the carburetion system are to atomize the fuel, mix it with air, vaporize it, deliver mixture to cylinder.

9. The parts of the fuel system include air inlet system, fuel tank, carburetor, and intake manifold.

10. Speed control is provided by placing a flat disc in the throat above the venturi.

11. Two common types of governors are the air vane and centrifugal.

12. Starting a cold engine requires a richer fuel mixture which is accomplished by closing a second "butterfly" called a choke.

13. Three types of air cleaners used on small engines are oil-bath, oil-saturated, and dry-type.

14. Small engines generally use magnetos as a source of energy to produce electric spark.

15. The ends of the primary coil windings are connected to the breaker points and the ends of the secondary coal windings are connected to the spark plug.

16. Most small engines are air cooled rather than liquid cooled.

17. The four-cycle engine is lubricated from a supply of oil in the crankcase.

18. Low compression in small engines is generally a result of worn piston rings or valves.

19. The fundamental principle of trouble shooting is to check the simple things first.

20. If compression is satisfactory, the next thing to check is the amount of fuel in the tank.

21. A plugged air cleaner can cause an engine to flood.

22. The ignition system can be checked by removing the spark plug and observing the type of spark which occurs between the electrodes of the plug at regular intervals in the cycle.

23. When adjusting the carburetor during the final tune-up, set the idle-speed adjustment first, the idle-jet second, and main-fuel jet last.

TEACHER'S KEY

STUDENT WORKSHEET 2

THE TWO-CYCLE ENGINE

(Refer to VAS Unit 3020)

1. The two-cycle engine uses its crankcase as a fuel mixture transfer pump.

2. The two types of valves on two-cycle engines are reed and rotary.

3. Lubrication of two-cycle engines depends on adding oil to the gasoline.

4. The eight things which should be checked on the ignition system are;

   a. spark plug
   b. breaker point
   c. wiring
   d. flywheel
   e. condenser
   f. coil
   g. ignition switch
   h. magnet

5. The six things which should be checked on the fuel system are:

   a. carburetor main adjustmet needle
   b. carburetor idle adjustment needle
   c. carburetor inlet control valve
   d. fuel pump
   e. fuel filters
   f. air filters

6. The three things which should be checked for loss of power are:

   a. poor compression
   b. muffler
   c. overheating

OPERATION OF THE TWO-STROKE CYCLE ENGINE

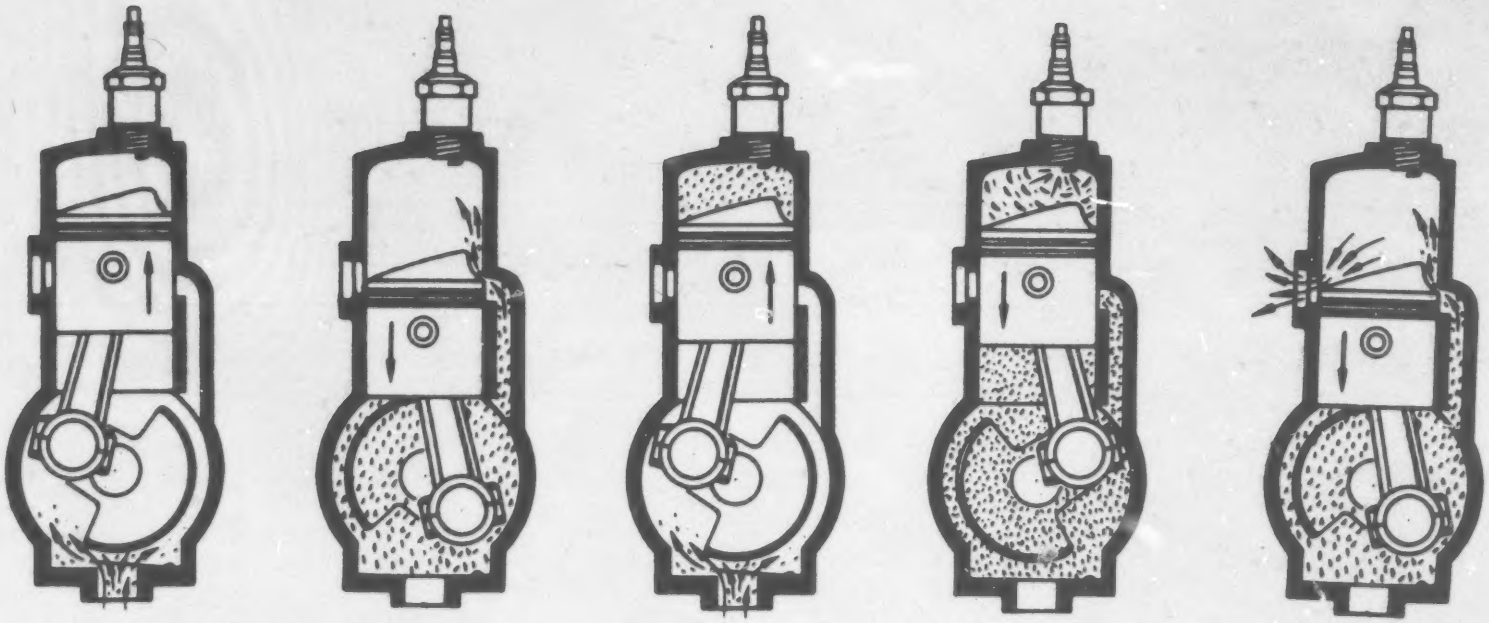


Fig. 1 Fig. 2 COMPRESSION Fig. 3 POWER Fig. 4 EXHAUST Fig. 5

M-II-D-3-33

Operation of the Two-Stroke Cycle Engine

In a two-cycle engine the five events: intake, compression, ignition, expansion (power) and exhaust are completed in two strokes of the piston or one revolution of the crankshaft.

This is shown in five illustrations as though no air-fuel mixture were in the combustion chamber. On the upward stroke of the piston, a partial vacuum is created in the crankcase. This vacuum, combined with atmospheric air pressure, causes the reed valve (shown here) between the carburetor and the crankcase to open.

The air-fuel mixture flows into the crankcase from the carburetor (Fig. 1). On the downward movement of the piston, the reed valve closes and the air-fuel charge is compressed in the crankcase. Near the bottom of the stroke, the piston uncovers the intake by-pass port connecting the combustion chamber with the crankcase.

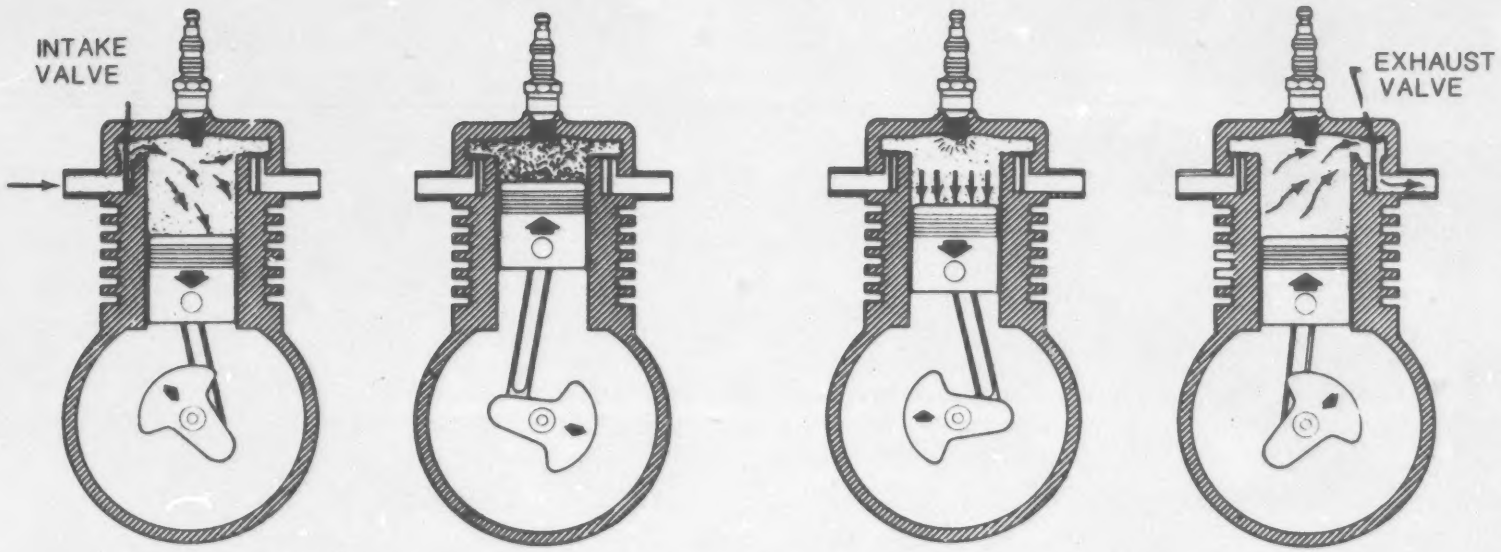
The compressed air-fuel mixture flows into the cylinder through the by-pass port (Fig. 2).

As the piston moves upward, it passes the by-pass or intake port and closes the opening. Its continued movement upward causes the air-fuel mixture to be compressed (Fig. 3). At the same time a new fuel charge is drawn into the crankcase. As the piston nears the top of the compression stroke, the fuel mixture in the combustion chamber is ignited by the spark plug and the expansion of the burning mixture forces the piston downward on the power stroke as the crankshaft passes top center.

As the piston nears the bottom of the cylinder, it uncovers the exhaust port opening. The pressure of the gases in the cylinder is quite high and a large portion of the burned air-fuel mixture is exhausted (Fig. 5).

Further downward travel of the piston uncovers the intake by-pass port. The charge of incoming air-fuel mixture helps force the exhaust gases out of the cylinder. The shape of the piston head causes the incoming gases to be deflected toward the spark plug. Unless there is an air-fuel mixture in the combustion chamber, two-cycle engines require cranking through 3 strokes of the piston to provide a compressed charge for combustion.

OPERATION OF THE FOUR-STROKE CYCLE ENGINE



A. INTAKE STROKE

B. COMPRESSION STROKE

C. POWER STROKE

D. EXHAUST STROKE

M-II-D-3-35

Operation of the Four-Stroke Cycle Engine

A stroke is defined as the movement of the piston from one end of its travel to the other. It may be either toward the crankshaft or away from it.

A. On the intake stroke, the intake valve opens while the exhaust valve remains closed. The piston moves downward and a partial vacuum is created in the cylinder. Outside air pressure forces a mixture of vaporized fuel and air into the cylinder.

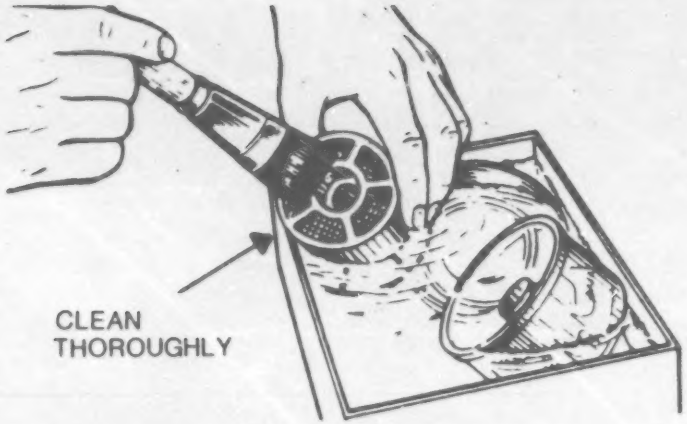
B. On the compression stroke, both valves are closed as the piston rises. The fuel-air mixture is compressed into the small space between the top of the piston and the cylinder head.

C. The timing mechanism actuates the ignition system which causes a spark to occur. The spark ignites the gas in the cylinder and the force of the explosion pushes the piston down. Both valves remain closed and this force of the expanding gases, driving the piston downward and delivering power to the crankshaft, is the "power stroke".

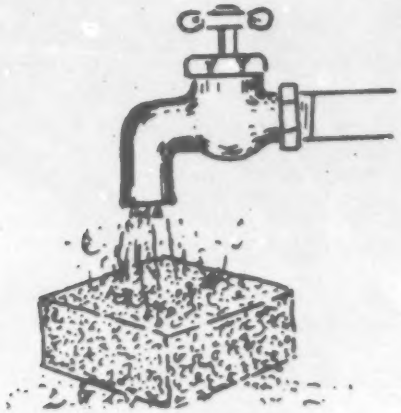
D. The exhaust valve opens as the piston rises again and the upward movement of the piston forces the burned gases out of the cylinder. The exhaust valve closes as the piston reaches the top of this stroke. As the piston starts downward, the intake valve opens and the cycle repeats itself.

REGULAR SMALL ENGINE MAINTENANCE

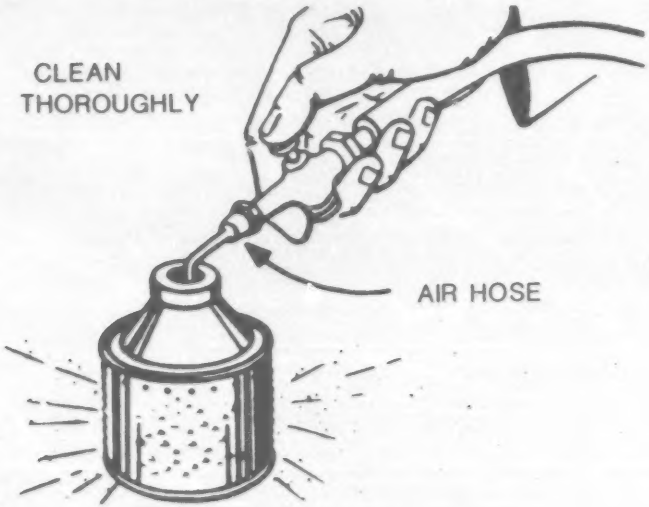
(Air Cleaner)



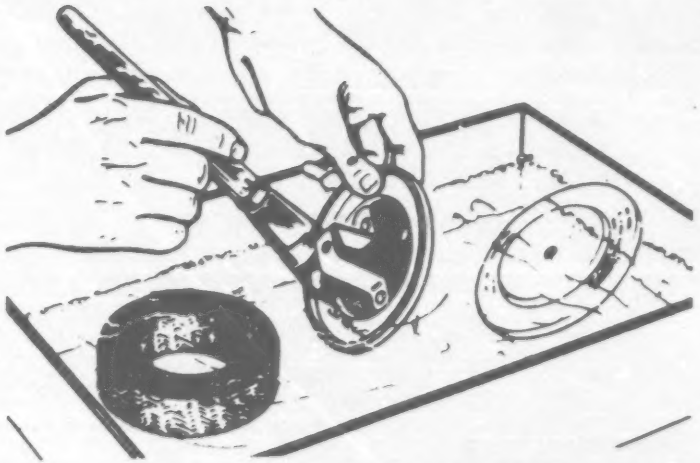
Oil Bath Air Cleaner



Polyurethane Air Cleaner



Dry-Type Paper Air Cleaner



Metalic Mesh Air Cleaner

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Regular Small Engine Maintenance
(Clean Air Cleaner)

Clean the Air Cleaner!

The air cleaner used on an air cooled engine must provide complete filtration of dust and dirt for maximum engine protection. If the air cleaner is not cleaned:

1. Dirt and dust are drawn into the engine. Dirt in the oil forms an abrasive mixture which wears the moving parts instead of lubricating them.
2. The flow of air is restricted and the mixture will be too rich.

The cleaner must deliver a full volume of clean air to insure the correct air-fuel mixture in the carburetor or raw gasoline may be drawn into the engine. This will wash the oil from the cylinder walls.

A. Oil Bath Air Cleaner

After removing the cleaner from the engine the cleaner should be disassembled and washed thoroughly in a cleaning solvent. If the bowl is plastic, make sure there are no cracks around the sealing areas.

Use compressed air to remove solvent from the mesh filler in the cover. Fill to the correct level with S.A.E. 30 engine oil.

B. Polyurethene Air Cleaner

These air cleaners require regular cleaning and re-oil service. After removing the element from the container, wash it in hot water, using soap to remove dust, dirt and original oil.

When the element is dry use S.A.E. 30 engine oil to resaturate it. Use enough oil to cover the surface of the element, which would be about one tablespoonful.

Hot water and soap are recommended since they are more readily available than solvent. The hot water will expand the element which will give a better seal around the edges when it is reinstalled in the container.

C. Dry-Type Paper Air Cleaner

After this cleaner is removed from the engine, it should be brushed with a bristle brush not a wire brush.

Next use an air hose to blow dirt from the inside of the cleaner.

Do not wet or soak this type cleaner in solvent or gasoline. Be sure the sealing gasket is in place when replacing the cleaner.

D. Metallic Mesh Air Cleaner

After this cleaner is removed from the engine, place the cleaner in a container of solvent. Do not use gasoline. Agitate the cleaner vigorously to remove all dirt and dust from the metallic mesh.

Dip the air cleaner in oil and replace the filter on the engine.

REMEMBER, all air for the carburetor must pass through the air cleaner to remove dirt and moisture.

MAKE SURE all sealing gaskets on the air cleaners are in place. After removing the air cleaner check for dust in the air cleaner body or in the carburetor. If dust is present, it had to come through the element or it leaked past a sealing gasket.

OBTAIN A NEW AIR CLEANER if yours becomes damaged or is lost.

DO NOT RUN YOUR ENGINE WITHOUT AN AIR CLEANER

REGULAR SMALL ENGINE MAINTENANCE
(Spark Plug)

Check the spark plug!

A. Check the kind of spark plug

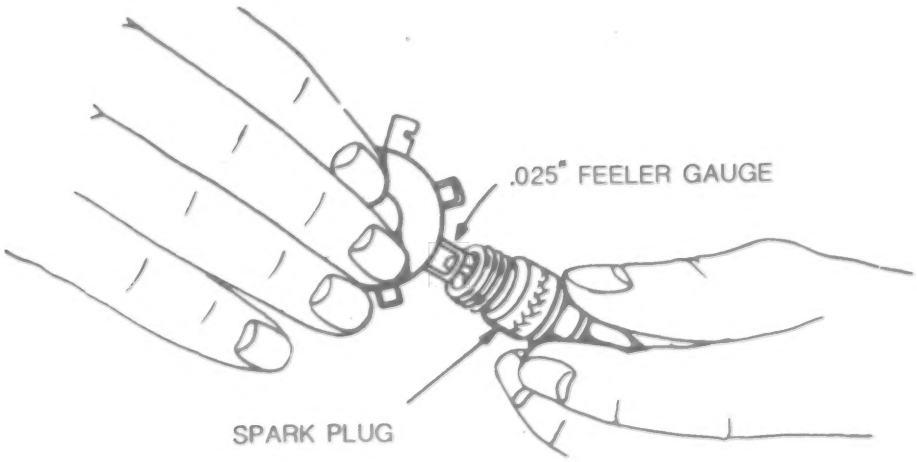
B. Check the spark plug condition

deposit on the plug

burned electrodes

cracked insulator

C. Replace the spark plug if necessary



M-II-D-3-39

Regular Small Engine Maintenance
(Spark Plug)

Check the spark plug!

A. Check the kind of spark plug

For a 4-cycle engine, a 14 mm plug, such as a Champion H-10, Champion J-8, or Auto Lite A-71 is recommended. Check your engine manufacturer's recommendation.

B. Check for spark plug condition

Check the deposit on the plug. A normal deposit is brown to grayish-tan. A carbon fouled plug has a deposit of dry, sooty carbon. An oil fouled plug has a wet, oily deposit.

Check for burned electrodes. If the electrodes are badly burned, replace the plug.

Check the insulator. If it is cracked, replace the plug.

C. Clean and reset the spark plug gap

The gap should be set at .025" every 100 hours of use

D. Install the spark plug

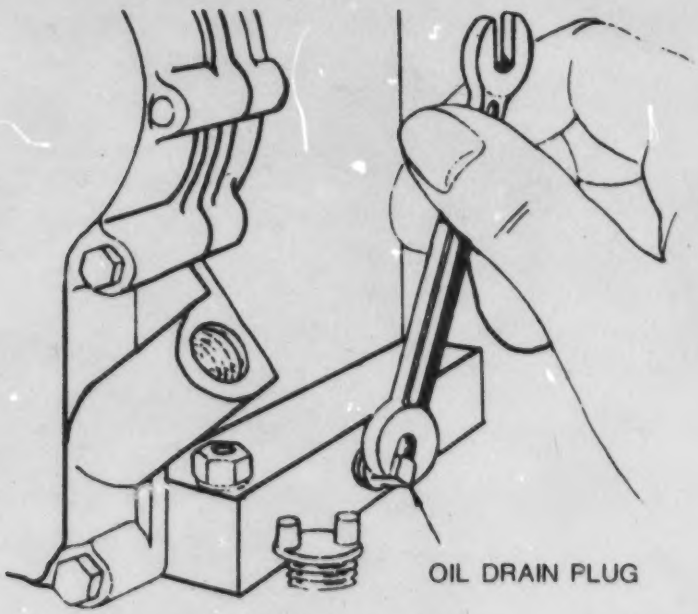
Put graphite grease on the threads and install the spark plug.

Use a torque wrench to tighten the plug to the proper torque as recommended by the manufacturer.

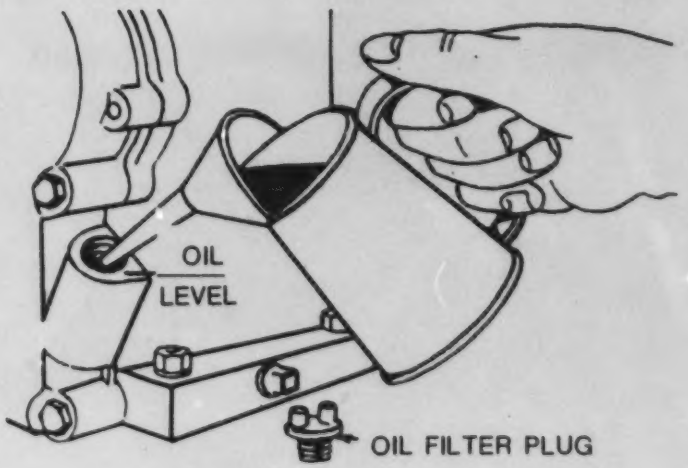
REGULAR SMALL ENGINE MAINTENANCE

(Crankcase Oil)

Change oil in the crankcase



Remove oil drain plug and drain while engine is warm



Fill crankcase to desired level with correct oil

M-II-D-3-41

Change Oil in the Crankcase!

Drain the oil from a new engine after five hours of operation.

Remove the oil drain plug.

Drain oil while the engine is warm.

Replace the drain plug.

Remove the oil filler cap and refill with new oil to correct level.

Check the oil each time before the engine is used.

If the engine is used for several hours, check the oil after 5 hours operation.

Under normal operating conditions, change the oil every 25 hours of use.

WINTER STORAGE OF SMALL ENGINES

1. Drain fuel supply
2. Drain oil from crankcase, refill
3. Pour one teaspoon of oil in upper cylinder
4. Clean outside of engine
5. Store engine in dry place
6. If engine is stored in unheated cool location, refill gas tank with gas to prevent rusting.

Winter Storage of Small Engines

1. Drain fuel supply

   Engines that are stored for a period of time should be completely drained of fuel to prevent gum deposits from forming on essential parts, such as the carburetor, fuel filter, fuel lines, and tank. These deposits will eventually harden and impair the efficient operation of the engine when it is used again.

   Drain the fuel tank completely.

   Operate the engine until the fuel supply is exhausted and it stops. Drain the carburetor bowl, if the engine is so equipped to remove all sediment.

2. Drain all the oil from the crankcase.

   While the engine is still warm, drain the oil from the crankcase.

   Refill the crankcase with clean oil.

3. Pour one teaspoon of oil in upper cylinder.

   Remove spark plug, pour one ounce of S.A.E. No. 20 oil into the cylinder and crank the engine slowly to spread the oil.

   Clean the spark plug and reset the gap to .025".

   Place some graphite grease on the threads and replace the plug.

4. Clean the outside of the engine.

   Clean dirt and chaff from the cylinder head, cooling fins, blower housing, etc.

5. Store in a dry place.

   If possible place a cover over the unit during the storage period.

   Do not place any heavy objects on the engine that can damage the parts or cause misalignment of the governor linkage or other controls.

FUEL PROBLEMS AFFECTING STARTING

Spark Plug Dry

Crankcase leaking (2-cycle)

Intake manifold leaking

Carburetor jets dirty

Choke not closing

Fuel pump not working

Fuel tank empty

Fuel line- closed

Spark Plug Wet

Excessive oil in mixture (2-cycle)

Air cleaner dirty

Choke sticking closed

Choke used too much

Mixture too rich

Float sticking open

Fuel is stale

Water in fuel

Wrong fuel used

CAUSES OF POOR COMPRESSION

No compression or poor compression indicates these possibilities:

1. Worn cylinder
2. Worn piston rings
3. Leaking gaskets
4. Worn piston
5. Leaking valves which can be caused by:
   a. seats burned
   b. valves burned
   c. valve springs weak or broken
   d. valve stem warped or sticking in valve guide
6. Loose spark plug
7. Loose cylinder head bolts
8. Warped cylinder head
9. Broken connecting rod
10. Insufficient tappet clearance

ENGINE STARTS--HEATS EXCESSIVELY

Cooling fins choked

Cooling air intake blocked

Governor adjustment allows over-speed

Muffler clogged

Piston or rings fit too tight

Ignition timing late

M-II-D-3-47

ENGINE STARTS--CONSUMES OIL EXCESSIVELY

Wrong fuel/oil mixture (2-cycle)

Crankcase breather clogged

Piston burned or warped

Cylinder bore worn

Piston rings worn

Engine overheating

Wrong oil used

Oil diluted by rich mixture

ENGINE STARTS--VIBRATES, LACKS POWER

Vibrates Excessively

Crankshaft bent

Flywheel out of balance

Drive couplings worn

Attachments out of balance

- mower blade out of balance
- mower blade loose

Lacks Power

Air cleaner dirty

Timing out of adjustment

Point gap incorrect

Muffler or exhaust port clogged

Carburetor out of adjustment

Compression low

Governor defective

SAMPLE TEST QUESTIONS
AND TEACHER'S KEY

SERVICING SMALL GAS ENGINES

True or False

__F__ 1. Spark plugs that are cracked need not be changed.

__F__ 2. Oil is not added to the crankcase of four-cycle engines.

__T__ 3. Most small gas engines are air cooled when used on lawnmowers.

__F__ 4. The crankcase of two-cycle engines is sealed and filled with lubricating oil at the factory.

__T__ 5. In a gravity feed fuel system, the gas tank is above the carburetor.

__F__ 6. When one chokes an engine, you shut off part of the fuel supply.

__F__ 7. A condensor is not necessary on small engine magneto ignition systems.

__T__ 8. Small engines have their ignition timed properly by having the points open at the correct time.

__T__ 9. It is important to keep dirt and trash cleaned from small engines to prevent them from overheating.

__T__ 10. A fundamental principle of trouble-shooting is to check the simple things first.

__T__ 11. If an engine is flooding and will not start or run properly, the trouble could be caused by a plugged air cleaner.

__F__ 12. If an engine has no spark at the plug, the first thing you should do is put on a new ignition coil.

__F__ 13. One of the most common forms of ignition trouble in small engines is caused by oil in the fuel.

__T__ 14. A torque wrench is used to measure the pressure applied when tightening a stud or bolt.

__F__ 15. When doing small engine tune-up it is not necessary to use any service or operator's manuals.

__T__ 16. On suction-feed fuel systems, the carburetor is usually above the gas tank.

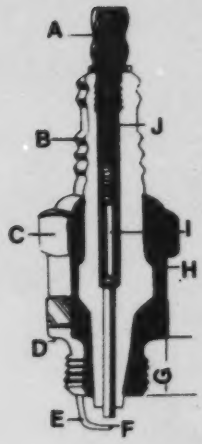
__T__ 17. If it is necessary to replace a flywheel key, use a special soft metal key to prevent engine damage.

__T__ 18. The carburetor is a device for mixing the gasoline and air at proper ratios.

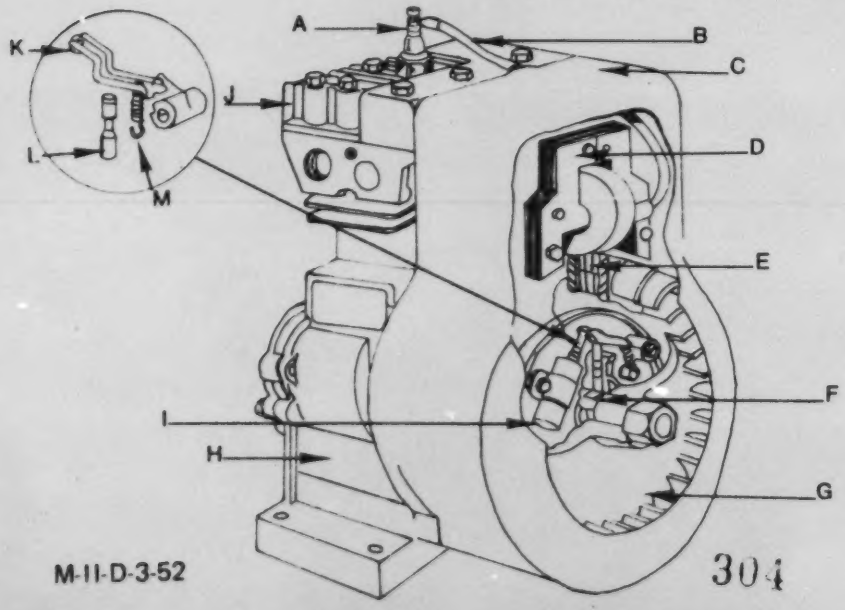
__T__ 19. The main cause of overheating of small engines is accumulation of dirt in the fins on the cylinder and head.

__T__ 20. Gasoline should never be used as a solvent to clean small engines of dirt and trash.

21. Identify the parts of the spark plug (refer to VAS Unit 3026)



22. Identify the following small engine parts and briefly describe their function. (refer to Small Engine Repair Manuals and VAS Unit 3014)



UNIT D: HORTICULTURE/AGRICULTURE MECHANICS

PROBLEM AREA: GLAZING

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year students in a horticultural/agricultural occupations program. The recommended time for teaching this problem area is during the spring semester.

The estimated instructional time for this problem area is 2 to 4 days. Depending on how far the teacher wishes to go in developing glazing and/or recovering skills at the second-year level. If the teaching plan is limited to classroom discussion with little or no practice or observation, the instruction can be 2 days or less. If the students are to be involved in lab or other learning, activities instructional time will need to be extended.

The instructor is encouraged to conduct a local search to locate other supplementary masters for use with this problem area. The items in this problem area are for reference or modification as the instructors adapt this problem area to their local situation.

CREDIT SOURCES:

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The teacher's guide, student worksheet, information sheet and test questions were developed by Don Bergfield, Paris High School and Jim Ethridge, Joliet Junior College, and Ron Biondo, Department of Vocational and Technical Education, University of Illinois. Transparency masters and the transparency discussion guide were prepared by the Vocational Agriculture Service, University of Illinois. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Pilot Test Teachers.

TEACHER'S GUIDE

1. Unit: Horticulture/agriculture mechanics

II. Problem area: Glazing

III. Objectives: At the close of this problem area the student will be able to:

1. Identify necessary tools and equipment to complete a glazing job.
2. Identify and complete the steps involved in replacing greenhouse.
3. List and discuss practical applications of glazing.
4. Remove and replace plastic from greenhouses.

IV. Suggested interest approaches:

1. Discuss the economic advantages of being able to do your own glazing and replacing of plastic.
2. Discuss the consequences of not having broken glass and torn plastic repaired.
3. Present the possibility of a broken window pane to the class. Ask how they would solve the presented problem.
4. Take a field trip to a greenhouse which needs glazing or is in the process of glazing.

V. Anticipated problems and concerns of students:

1. What is glazing?
2. What kinds of glass are available?
3. Where do we get glass and plastic for reglazing?
4. What tools and equipment do we use in glazing?
5. How do we glaze glass?
6. How is glazing used in the home situation?
7. How expensive is glazing?
8. How do I glaze a poly wuonset hut?
9. What are the advantages of doing the glazing ourselves?
10. What safety precautions should I be aware of when glazing?

VI. Suggested learning activities and experiences:

1. Have the students answer their own problems and concerns through use of use of VAS unit 3039, "Glazing."

2. View slidefilm VAS 680, "Greenhouses and Related Structures" and conduct discussion with aid of script.

3. Identify tools and equipment used in glazing in the form of a replacing plastic.

4. Demonstrate and discuss the process of glazing and replacing plastic.

5. Conduct a lab in which students are given the opportunity to develop glazing and plastic replacement skills.

6. Explain in detail safe procedures used in proper glazing techniques.

7. Explain in detail safe procedures used in proper plastic replacing techniques.

8. Build a cold frame using flass fiberglass for polyethylene. Refer to the transparency "cold frame."

VII. Application Procedures:

1. Encourage students to use their glazing abilities at home or while working with the on job training class.

2. Encourage students to use their plastic replacing abilities at home or work.

VIII. Evaluation:

1. Instructor assessment of glazing and plastic replacement skills performed by students.

2. Completion of safety quizzes.

3. Completion of general knowledge test, including procedure, equipment and application.

IX. References and aids:

1. Vocational Agriculture Service, University of Illinois, subject matter Unit 3039, "Glazing."

2. Vocational Agriculture Service, University of Illinois, slidefilm and script 680, "Greenhouses and Related Structures."

3. Circular 905, Plastic Greenhouses, University of Illinois, College of Agriculture, Cooperative Extension Service, U of I.

4. Safe Practices in the VoAg Shop and quizzes.

5. Transparencies - Describing and Demonstrating the Glazing Procedure.

6. Teacher's guide and suggested test questions with teacher's key.

INFORMATION SHEET

INSTALLING FILM PLASTICS AND FIBERGLASS

Plastic glazing films should be fastened to greenhouse frames on calm, warm days. The film should be drawn taut so as to remove sags, but not so taut that the film will contract in cold weather and break loose from the rafters. In general, plastic film will break down where it was creased or folded and along the rafters. It is advisable to use batten strips, at least as wide as the rafters, to secure the film. The batten strips should be from 3/8" to 1/2" thick. Galvanized 4-penny nails, spaced 4 inches apart and staggered, are recommended. Do not drive nails within one inch of the edge of the film. Sometimes two-headed nails are used because they are easy to remove.

Corrugated fiberglass panels are preferred to flat planes due to the added structura. strength. The maximum suggested spacing of purlins perpendicular to 2½ inch corrugated fiberglass is 3 feet. Special molding strips, spacers, screws and fasteners are used to secure fiberglass. Th panels should over-lap and rivets can be used to fasten them together. Holes should be drilled to install the rivets and to screw the panels to the greenhouse framework.

Additional information on glazing with plastic film or fiberglass is available from suppliers.

JOB SHEET

REPLACING AND GLAZING GLASS

I. Objective: Given a situation with broken glass, replacement glass, glazing compound (appropriate for the situation) and all necessary tools; the student will replace the broken glass.

II. Procedure:

NOTE: Safety goggles should be worn when breaking glass.

1. Do not buy more glazing compound that will be needed for the job. Glazing compound tends to dry out in storage and may have to be thrown away.

2. Use a glass cutter (left) to cut glass. A putty knife (center) or a glazing knife (right) will help you install glazing compound in a neat and satisfactory manner.

3. Use the glass cutter to mark or scratch the glass in one continuous stroke. Use a straight edge or square to keep the cut straight.

4. To break a small piece of glass, grasp it firmly on each side of the cut with the thumb and forefinger, and give a slight outward and downward twist.

5. Use a propane torch to heat the old putty to help remove it when taking a broken glass out of a sash.

6. Use pliers to remove old glazier's points and a paint scraper to remove the old putty from the sash.

7. Apply linseed oil or a primer coat of paint to prevent the wood from absorbing the oil from the glazing compound.

8. Bed the frame before inserting the glass by applying a thin layer of putty on the wood.

9. Fasten the glass in place with glazier's points.

10. Apply glazing compound around the glass to make the joint as watertight and as windproof as possible.

III. Observations:

JOB SHEET

REPLACING PLASTIC COVERING ON STRUCTURES

I. Objective:

Given a structure with torn or aged plastic covering, new plastic covering, necessary tools and equipment the students will replace the plastic covering.

II. Procedure:

NOTE: Replacing plastic film should be done on warm, calm days.

1. Idnetify greenhouse area or sections in which plastic is to be replaced.

2. Remove torn or worn plastic and dispose of appropriately.

3. Remove old staples, nails, etc., and smmoth any rought or splintered wooden edges.

4. Cut new plastic to fit.

5. Install new plastic by stretching the plastic over the existing structure.

6. Secure the plastic film with 3/8" to 1/2" thick battens and 4-penny galvanized nails. Drive the nails 4 inches apart in a scattered arrangement.

7. Return tools and leftover materials to storage.

III. Observations:

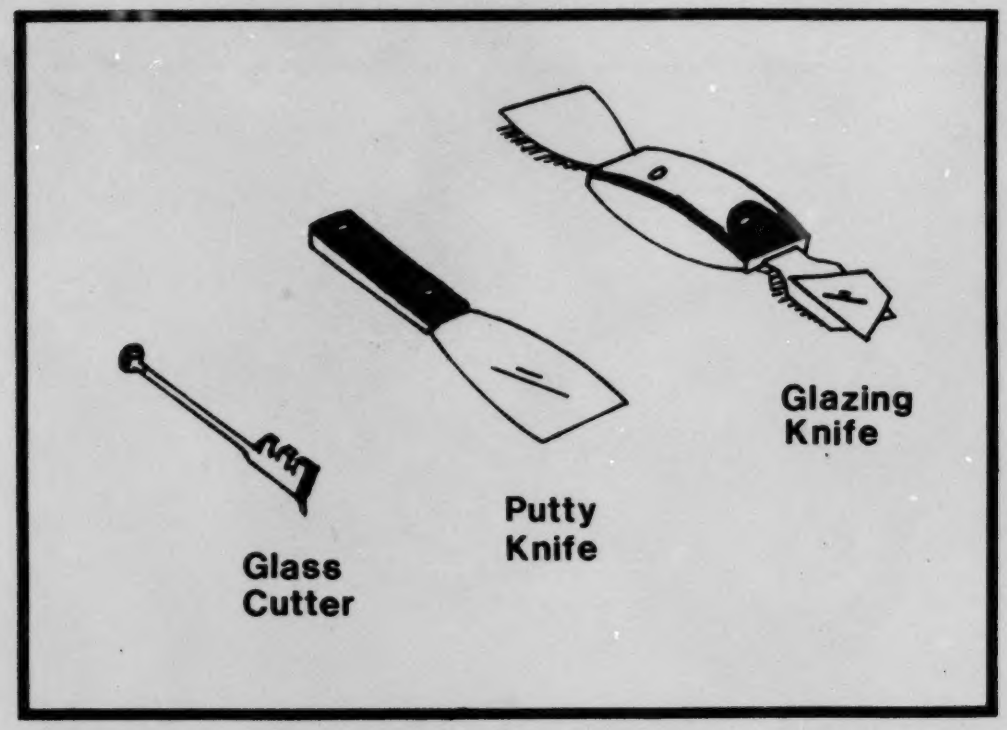
Glazing Compounds

Preferred over putty

Used to hold glass in place and seal windows

Can dry out in storage after opened

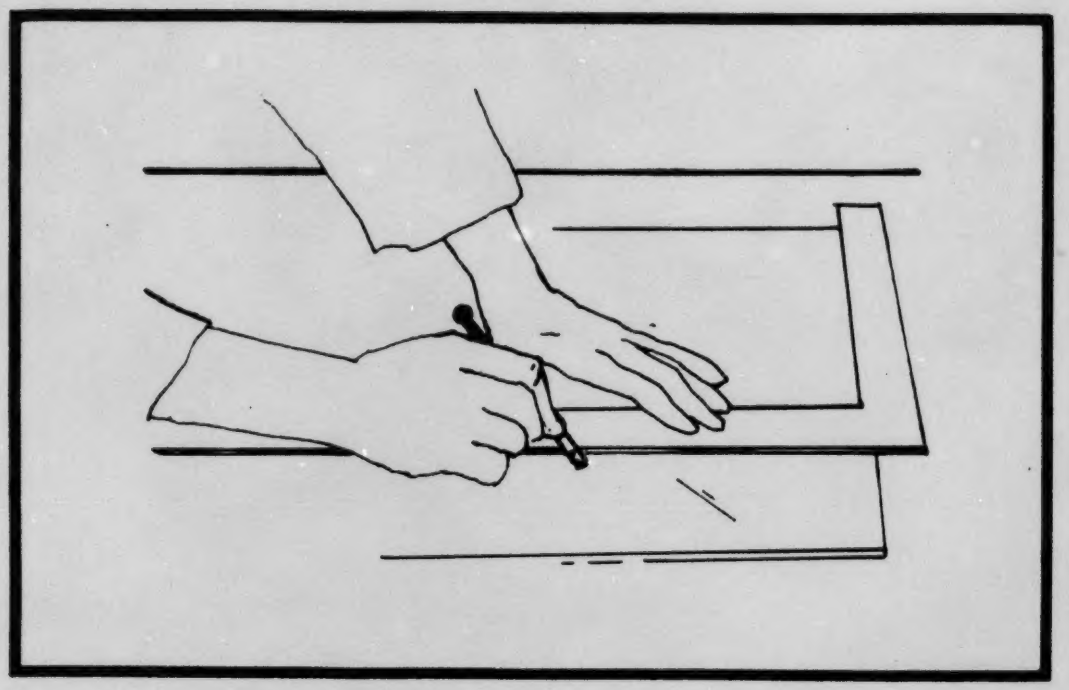
Glass Fitting Tools



Glass Cutter-special cutter required for cutting glass

Putty Knife and Glazing Knife-used to apply glazing compound to the glass and frame

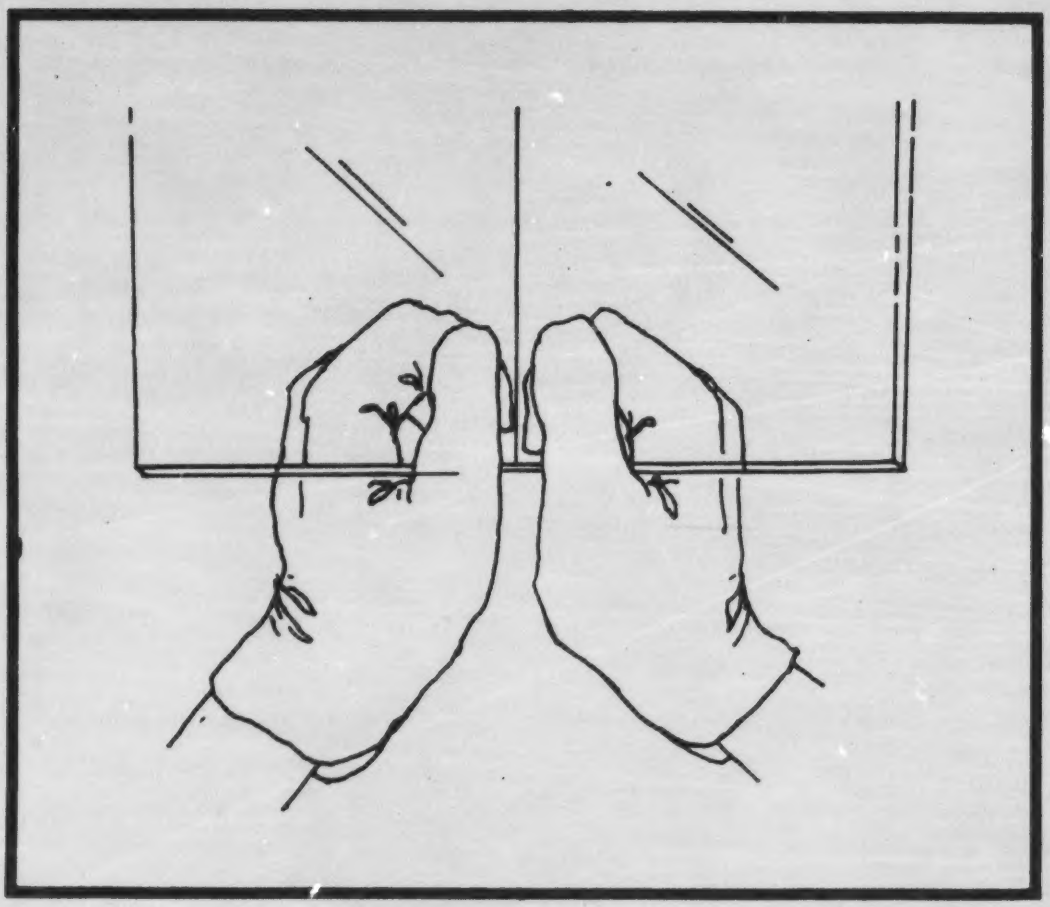
Cutting Glass



Use a glass cutter to mark the glass

Reduce chipping by using kerosene or turpentine on the cutter

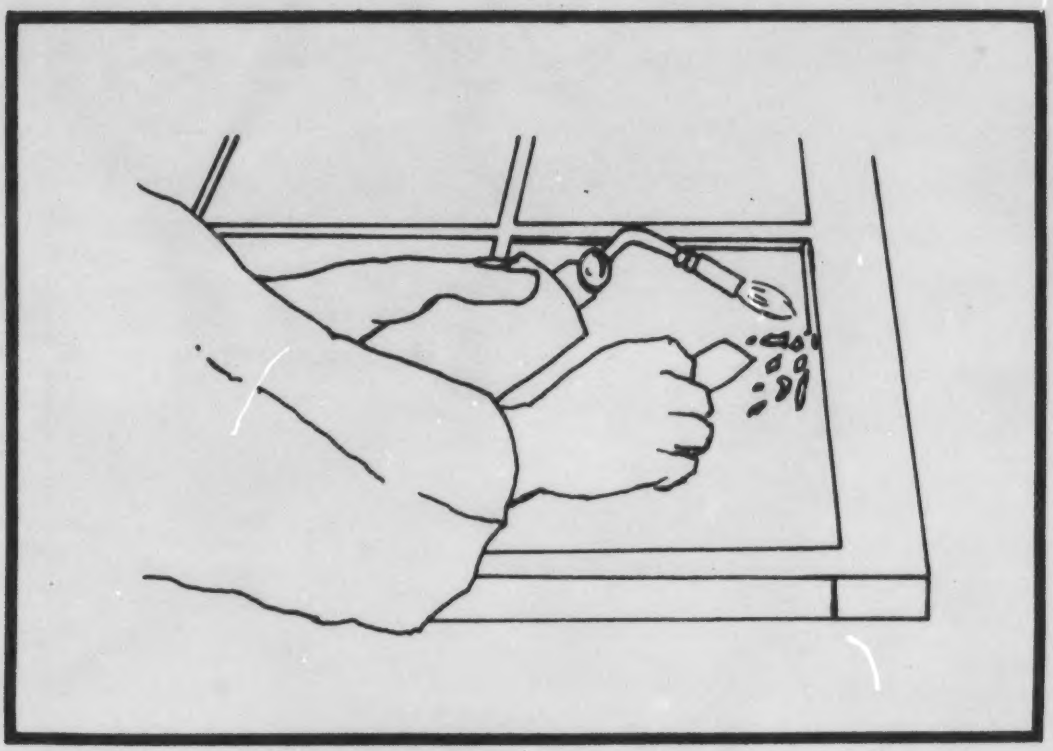
Breaking Glass



Small pieces can be broken by hand

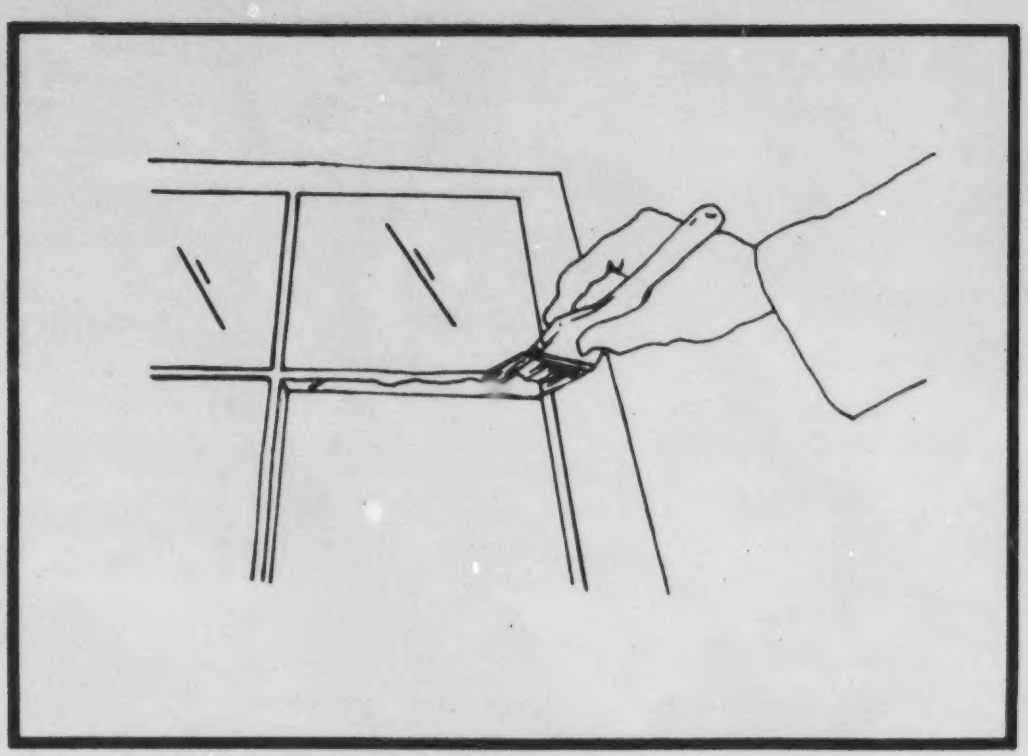
Large pieces can be broken over the edge of a table

Removing Old Putty



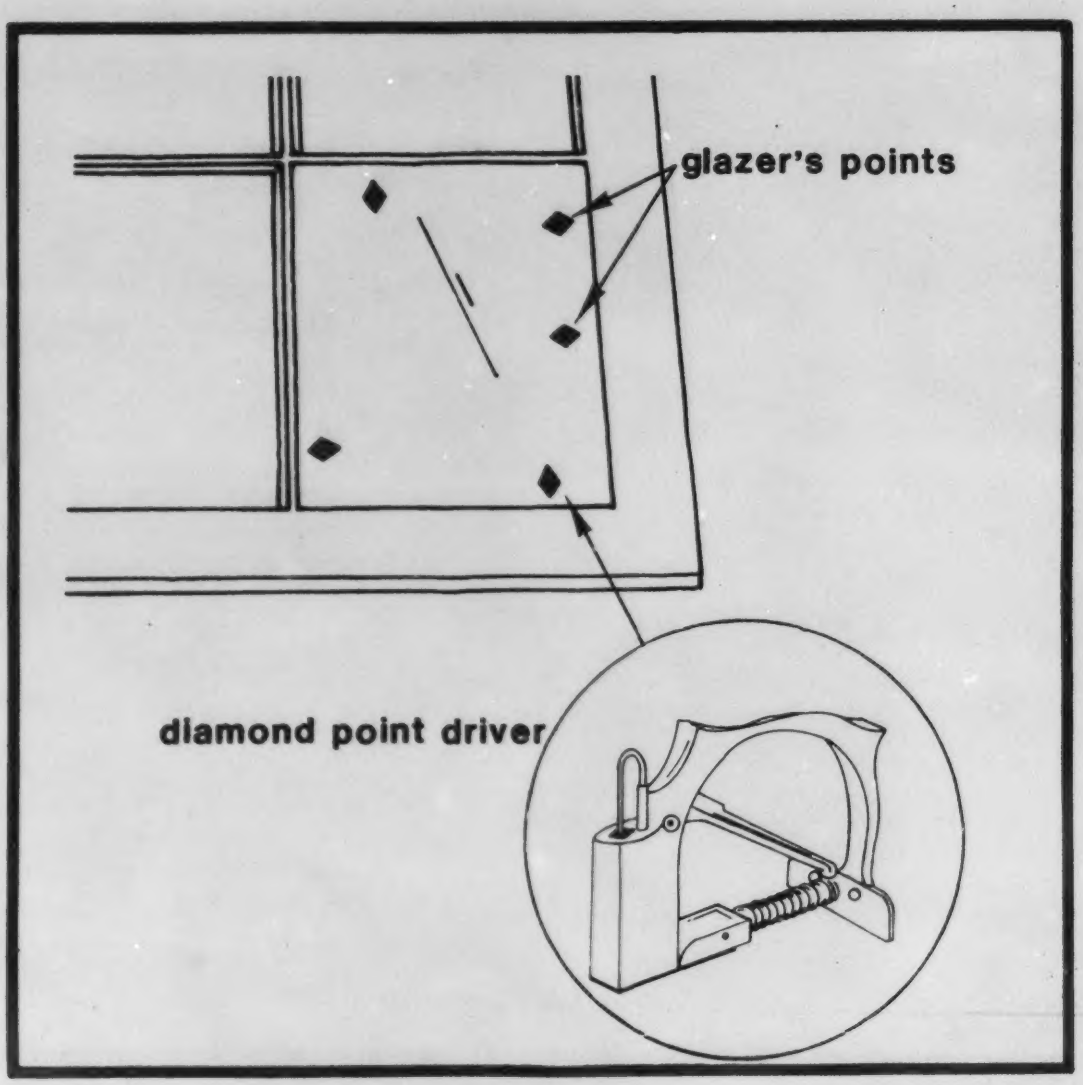
Heat the old putty with a propane torch and scrape with a putty knife.

Preparing Window Frames



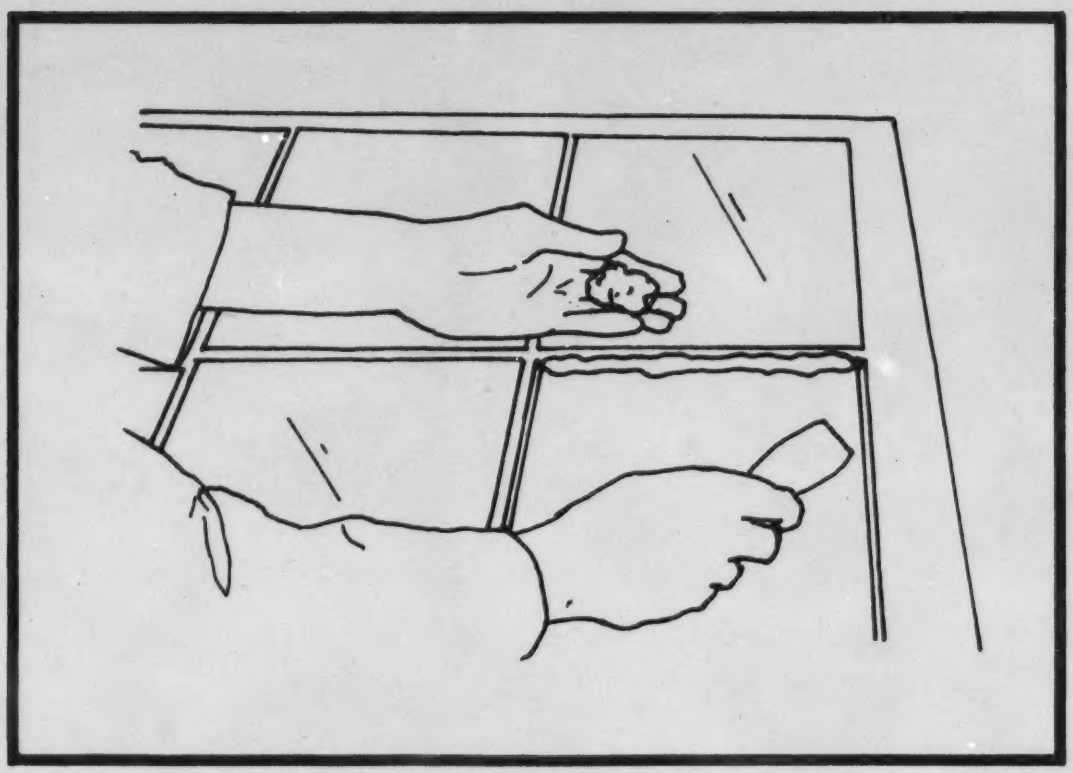
Wooden frames may need to be treated with linseed oil or a primer paint to reduce the absorption of the glazing compound oil.

Fastening The Glass



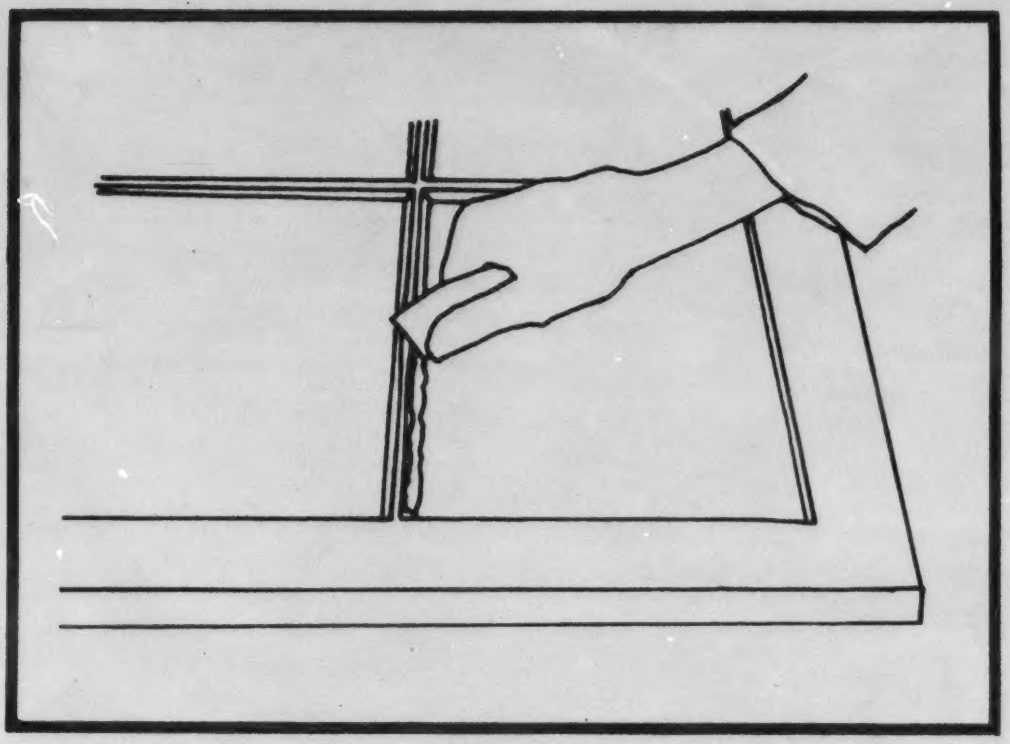
Use two or three glazer's points on a side.

Bedding Glass



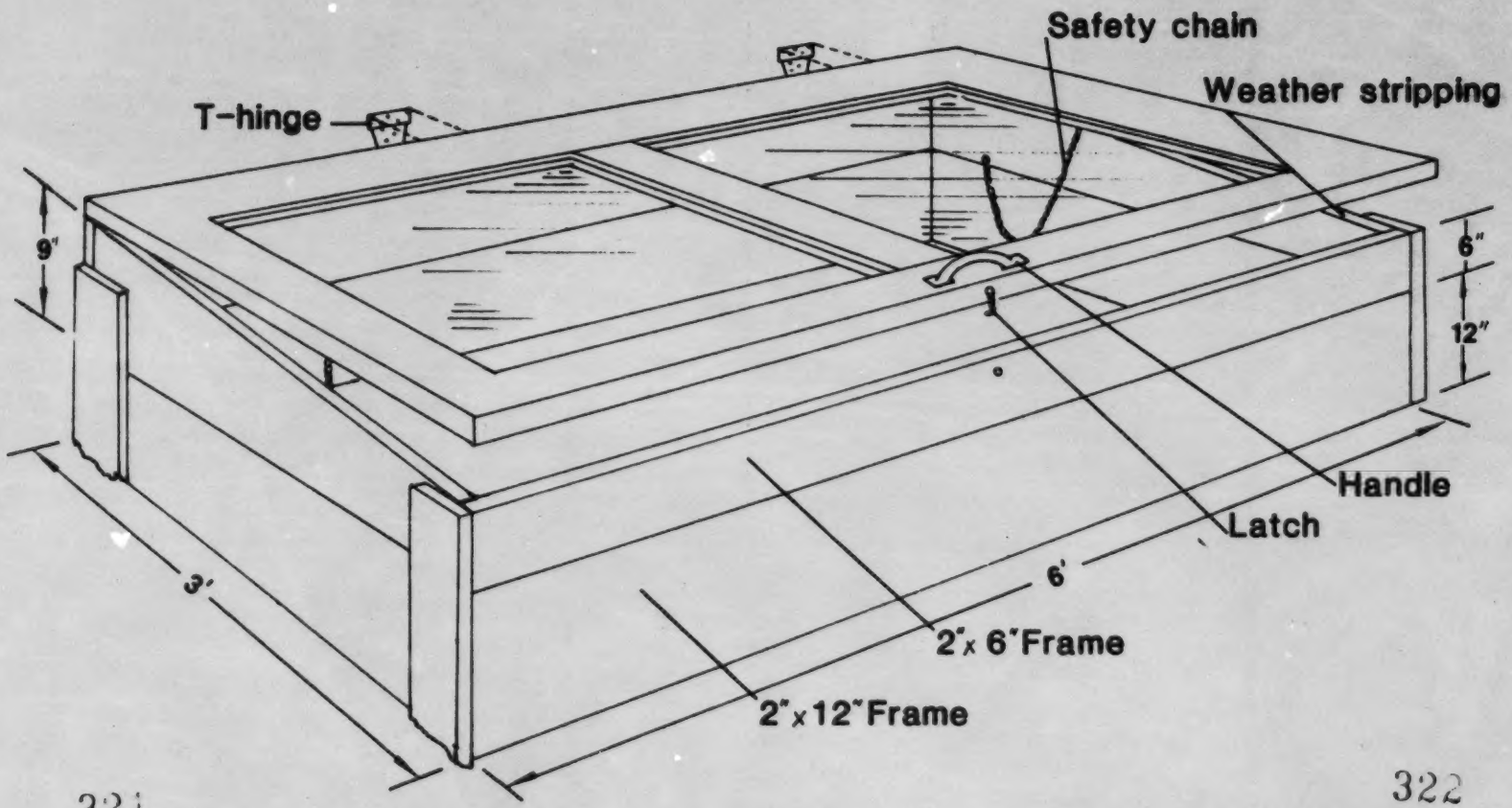
Apply glazing compound to the width of the window on the opposite side and to the depth of the frame.

Sealing The Glass



Apply a thin layer of glazing compound to the frame to help seal the window.

COLD FRAME


Safety chain
Weather stripping
T-hinge
9"
6"
12"
Handle
Latch
3'
6'
2"x 6"Frame
2"x12"Frame

TRANSPARENCY DISCUSSION GUIDE

I. Transparency - Glazing Compound

Do not buy more glazing compound than will be needed for the job. Glazing compound tends to dry out in storage and may have to be thron away.

II. Transparency - Glass Fitting Tools

Use a glass cutter (left) to cut glass. A putty knife (center) or a glazing knife (right) will help you install glazing compound in a neat and satisfactory manner.

III. Transparency - Cutting Glass

Use the glass cutter to mark or scratch the glass in one continuous stroke. Use a straight edge or square to keep the cut straight.

IV. Transparency - Breaking Glass

To break a small piece of glass, grasp it firmly on each side of the cut with the thumb and forefinger, and give a slight outward and downward twist.

V. Transparency - Removing Old Putty

Use a propane torch to heat the old putty to help remove it when taking a broken glass out of a sash. Use pliers to remove old glazier's points and a paint scraper to remove the old putty from the sash.

VI. Transparency - Preparing Window Frames

Apply linseed oil or a primer coat of paint to prevent the wood from absorbing the oil from the glazing compound.

VII. Transparency - Bedding Glass

Bed the fram before inserting the glass by applying a thin layer of putty on the wood.

VIII. Transparency - Sealing the Glass

Fasten the glass in place with glazier's points.

IX. Transparency - Sealing the Glass

Apply glazing compound around the glass to make the joint as water-tight and as windproof as possible.

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

GLAZING

True (+) and False (o)

o 1. When buying glazing compound one should buy large amounts to get a bargain.

+ 2. Glazer points should always be used to fasten glass in frame.

o 3. Common window glass can only be bought in single strength.

0 4. Replacing torn plastic yourself is more expensive than calling a repairman.

+ 5. You should always remove old paint on a fram to be glazed.

o 6. Glazing should be done with the frame fixed in place in the building.

o 7. When using a glass cutter two or three cuts should be made.

+ 8. Tempered glass is commonly used in rear windshields in cars.

+ 9. Double layering is often beneficial in plastic replacement.

o 10. Glazing putty very rarely drys out when exposed to weathering.

o 11. A propane torch is never used to remove old putty.

+ 12. Kerosene may be used to Moisten the glass cutter.

o 13. A glass cutter uses an extemeley shart cutting edge.

+ 14. Wooden window frames may not if not protected by glazing compound in putty.

o 15. There are no safety procedures to follow while glazing.

o 16. Plastic films should be drawn as taut as possible so snow will slide off.

+ 17. Plastic films are usually used to cover quonset hut type greenhouses.

+ 18. Fiberglass panels should overlap and be riveted together.

o 19. Plastic film can be fastened to a frame anytime.

o 20. Battens used to secure plastic films should be 3/4" to 1" thick.

UNIT E: Plant Propagation

PROBLEM AREAS:

1. Propagating herbaceous plants by grafting

UNIT E: PLANT PROPAGATION

PROBLEM AREA: PROPAGATING HERBACEOUS PLANTS BY GRAFTING

SUGGESTIONS TO THE TEACHER:

This problem area is designed to be used with sophomore or second-year students in a horticultural or agricultural occupations program. The recommended time for teaching this problem area is during the fall semester. Specific training on the safe use of a grafting knife prior to teaching this unit is needed. It is also suggested that the instructor receive instruction on safe grafting practices and use of grafting equipment.

The estimated instructional time for this problem area is 3 to 5 days depending on how far the teacher wishes to go in developing herbaceous grafting skills at the second-year level. If the teaching plan is limited to classroom discussion with little or no practice or observation, the instructional time can be 3 days or less. If the students are to be involved in other activity exercises, the instructional time will need to be increased.

The instructor is encouraged to conduct a local search to locate other supplementary materials for use with this problem area. The items in this problem area are for reference or modification as instructors adapt this material to their local situation.

CREDIT SOURCES:

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The teacher's guide, student worksheet, and test questions were developed by Jim Ethridge, Joliet Junior College, and Ron Biondo, Department of Vocational and Technical Education, University of Illinois. Transparency masters and the transparency discussion guide were prepared by Vocational Agriculture Service, University of Illinois. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Field Test Teachers.

TEACHER'S GUIDE

I. Unit: Plant propagation

II. Problem area: Propagating herbaceous plants by grafting

III. Objectives: At the close of this problem area students will be able to:

1. Define grafting.
2. Understand the methods of herbaceous grafting.
3. Propagate plants by herbaceous grafting.
4. Identify reasons as to why one would graft herbaceous plants.

IV. Suggested interest approaches:

1. Ask the students if they think it is possible to grow tomatoes and potatoes on the same plant. If so, how could this be accomplished?
2. Bring a grafted cactus to class and ask how such different growth can occur on one plant.

V. Anticipated problems and concerns of students:

1. What are the different types of grafts?
2. When does one use grafting?
3. What season is best for grafting?
4. What are the requirements for a successful graft?
5. How does one match tissue?
6. Why must scion and stock be compatible?
7. What are the different types of grafts used today?
8. How do you prepare a root stock?
9. Is cambium important in grafting?
10. What considerations must one undergo in choosing a root stock and scion?
11. What tools are used in grafting?
12. Why is the cambium important in grafting?

13. What is grafting?

14. Why does one graft plants?

15. What are some varieties started by grafting?

16. What factors affect good grafts?

17. How long does it take for a graft to callus?

18. What is a root stock?

19. What is a scion?

20. What is the method and purposes of the most common grafting procedures?

21. What sanitary practices must be carried out when grafting?

VI. Suggested learning activities and experiences:

1. Show slides and films on nursery propagation and how long it takes from grafting to selling of the plant.

2. Show slides of herbaceous grafting, especially machine grafts and the uncommon grafts which are no longer commercially profitable for the propagator but might be of some value to the hobby propagator.

3. Grow some potato sprouts and do a herbaceous graft with a tomato seedling. Discuss why this is done.

4. Demonstrate grafting to science class as an interest approach to getting recruits into the horticulture program.

5. Take a field trip to a nursery to watch a grafting operation.

6. Dig seeding root stocks and prepare them for grafting.

7. Have students practice collecting scions.

8. Make a display for each type of grafting procedure and identify plants commonly propagated by this method. Have this be an FFA Poster Contest and award the students prizes for the best educational display.

9. Graft cacti or set up a display collection of grafted cacti.

VII. Application procedures:

1. The main purpose of this problem area is to teach information and develop more interest in grafting and grafting techniques used on herbaceous plants.

2. The application phase should be emphasized in the land laboratory, school greenhouse, and on-the-job experience. Activities can also be done at home with minimum expense. The student should be able to graft plants and not simply observe.

VIII. Evaluation:

1. Prepare and administer a pencil-paper test using the Sample Test Questions.

2. Collect and grade the worksheets on grafting.

3. Evaluate the performance of students during the laboratory experiences in grafting.

IX. References and aids:

1. Vocational Agriculture Service Subject Matter Unit 5006, "Producing Plants by Asexual Propagation."

2. Sample test questions and Teacher's Key.

3. Information Sheets included in this problem area:

   a. "Grafting Cactus"
   b. "How to Sharpen a Knife Properly"

4. Laboratory exercises included in this problem area:

   a. "Grafting Cactus"
   b. "Potato/Tomato Plant Graft"

5. Transparencies and transparency discussion guide

INFORMATION SHEET

GRAFTING CACTUS

Plant growers sometimes wish to put a slow-growing species onto a strong, quicker-growing stock in order to raise a large plant more speedily. The same process can be adopted to obtain a number of cuttings, since some plants do not normally branch freely on their own roots but will do so when grafted. In addition to using grafting as a means of getting surplus cuttings, or growing a plant very quickly, it can be carried out in order to save a valuable plant which has lost its roots, or to grow certain cristate or other species which are difficult to cultivate on their own root system. For example, many cristate plants form into tight mounds, and when grown on their own roots in a damp humid winter atmosphere, rotting can occur because there is insufficient air circulation around the plant. This can be avoided by growing such a plant on a graft.

A plant can be grafted at any age, although it is easier to carry it out on a young specimen which has not yet become woody. It is a very simple matter to graft young plants between one and two years of age, but it can also be done with very young seedlings. All one needs is a very sharp knife or razor blade, plus a steady hand. A page of diagrams follows, with an accompanying key describing the various stages. This is more or less self-explanatory, and it is only necessary to mention two other points: (a) the stock to use, and (b) the after-care of freshly grafted plants.

Any cactus can be grafted onto another, but a strong growing stock has obvious advantages. We can highly recommend the following: Opunia pads (thick varieties with as few spines as possible), also various Trichocerei, Cerei, Myrtillocactus geometrizans, Pereskia, Pereskiopsis and Hylocerci. When grafting the other succulents it is essential to use plants of the same family. At this stage many of you may be more interested in grafting cacti than other succulents.

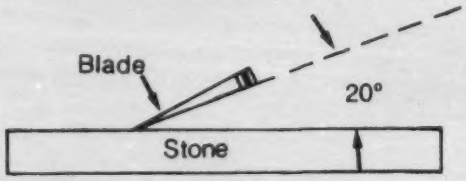
Once plants have been grafted, the stock should be kept moist by watering at the base, and the scion--the new top of the plant--should be kept shaded and in a warm place for 10-14 days. At the end of this period the fixings or weights can be removed, and, provided the scion does not drop off, the whole plant can then be treated normally. However, if the stock used is not an Opuntia, Trichocereus or Cereus, it will be necessary to winter the plants in a minimum temperature which does not drop too far below 50° F (10° C). There are a few Opuntias which are tender, but by far the majority likely to be grown will stand fairly cool winter conditions.

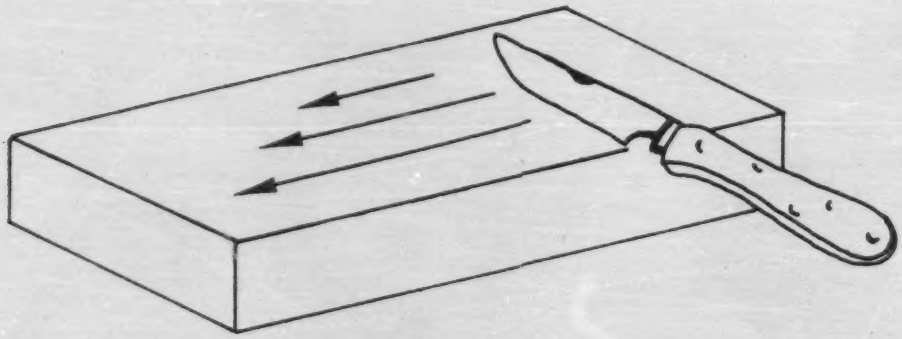
INFORMATION SHEET

HOW TO SHARPEN A KNIFE PROPERLY

For propagation work, the two general types used are the budding knife and the grafting knife. The budding knife can be used satisfactorily for both budding and grafting. The knives have either a folding or a fixed blade. The fixed-blade type is stronger, and if a holder of some kind is used to protect the cutting edge, it is probably the most desirable. A sturdy knife of high-quality steel is essential if much grafting work is to be done. The knife must be kept very sharp in order to do good work.

The initial grinding may be done with a fairly coarse stone, but a hard, fine-grained stone should be used for the final grinding. Do not use a carborundum stone, because it is too abrasive and will grind off too much metal. The knives may be beveled on both sides, or on one side only, the back side being flat. In sharpening the knife, hold it so that only the edge of the blade touches the stone in order that a strong edge for cutting can be obtained. Use the whole width of the stone so that its surface will remain flat. A correctly sharpened knife of high-quality steel should retain a good edge for several days work, with only occasional stropping on a piece of leather.





LABORATORY EXERCISE

GRAFTING CACTUS

I. Introduction:

Any true cactus can be grafted to any other true cactus. Grafting cactus is best done after the cactus has undergone its dormant period.

II. Equipment and Materials:

1. Stock
2. Scion
3. Gloves
4. Knife or razor
5. Newspaper strap
6. Kitchen tongs
7. Pin or rubber bands
8. Alcohol

III. Procedures:

1. Slice the top off the understock.
2. Prune the edges slightly downward so that it forms a slight inverted bowl.
3. Cut off the root end of the scion and prune the edges slightly upward.
4. Set the scion onto the understock. Make sure the scion fits well.
5. Maintain the contact between the two by weight (cross of rubber bands) or by pinning.
6. Keep the new plant dry and out of the sun for about two weeks.
7. When a gentle tug fails to dislodge the scion, remove the weight and give the new grafted plant its normal culture.

IV. Observations:

LABORATORY EXERCISE

POTATO/TOMATO PLANT GRAFT

I. Performance Objectives:

Given a potato, tomato seeds, 4" plastic pots, potting soil, labels, knife, and grafting rubbers, a student will propagate the potato and tomato plants and use the approach grafting method to create a potato/ tomato plant.

II. Materials Needed:

potato
tomato seeds
4" plastic pots
potting soil
labels
knife
grafting rubbers

III. Procedures:

A. Potato propagation:

1. Cut a potato into sections. Each section should contain 2-3 eyes or nodes.

2. Fill a 4" pot half full with dry media. Place one section, "eyes up," into the pot and cover with dry media, leaving one inch space at the top. (DO NOT WATER)

3. Three to four days later, water the plant.

4. Continue watering as needed.

B. Tomato propagation:

1. Fill a 4" plastic pot with moist media, leaving one inch space at the top.

2. Place three tomato seeds in the center of the pot and cover lightly.

3. Mist the pots or water lightly.

4. Keep pots under a mist system or cover the pots with clear plastic or glass. (Keep moist)

5. Once plants begin to grow, pull from mist system or remove covering.

6. Choose the best plant in the pot and remove the rest.

7. Continue to grow the plant.

C. Potato/Tomato Graft

1. Collect the tomato and potato plant once they are 4" or more in height.

2. Find a point on the stems of the plants where they can be pulled together.

3. At that point, cut half way into the stem and down about ½" in one smooth motion.

4. Put the sliced areas together and fasten with the grafting rubbers.

5. The graft should take in two weeks; at that time, cut off the tomato root stock and the potato shoot.

6. One week later, remove the grafting rubber.

7. Repot as soon as possible to a larger pot or outside to give ample room for the potato growth.

IV. Observations:

CLEFT GRAFTING OF EPIPHYLLUM ONTO A PERESKIA

1. CUT UNDERSTOCK

2. TRIM SCION

3. FIT SCION INTO UNDERSTOCK

4. FASTEN

CLEFT GRAFTING OF CHRISTMAS CACTUS ONTO MYRILLOCACTUS

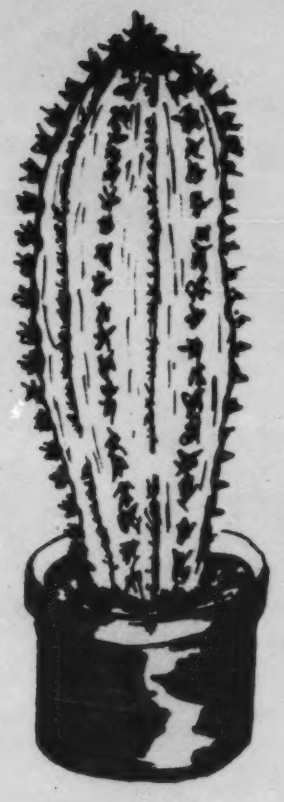
1. SLIT UNDERSTOCK

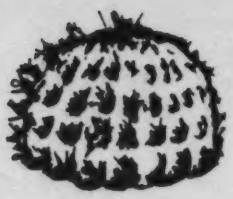
2. CUT SCION

3. INSERT SCION INTO UNDERSTOCK

4. FASTEN

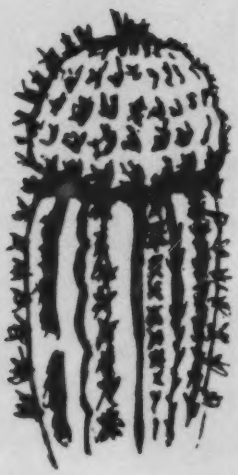
FLAT METHOD OF GRAFTING CACTUS





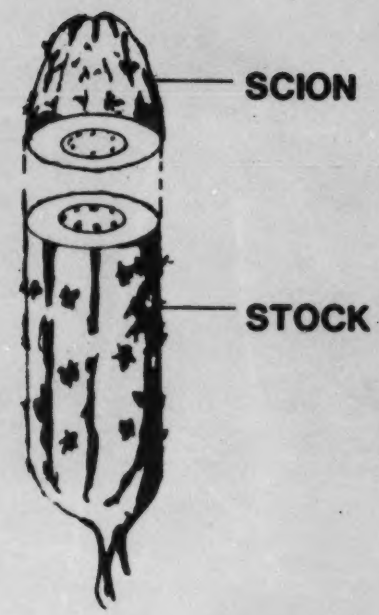
1. CUT UNDERSTOCK

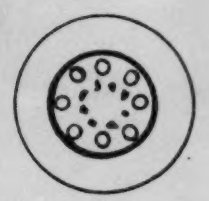
2. CUT SCION



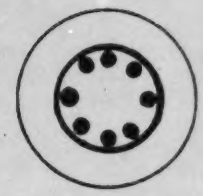
3. FASTEN UNDERSTOCK AND SCION TOGETHER WITH STERILE PINS

FLAT METHOD OF GRAFTING CACTUS





Cross section of scion
(double line and circles)



Cross section of stock.
(single line and circles)

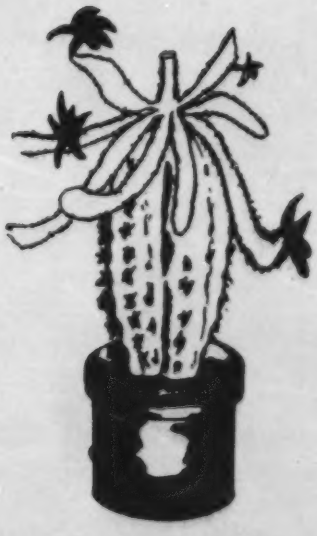
The ring of vascular channels through which food is conveyed should coincide for best graft.

EXAMPLES OF CACTI CLEFT GRAFTED AND GRAFTED BY THE FLAT METHOD

CHRISTMAS CACTUS GRAFTED ON TRICHOCEREUS

CHRISTMAS CACTUS ON OPUNTIA (PRICKLY PEAR)

NOTOCACTUS ON SPACHIANUS



RAT-TALL CACTUS (APOROCACTUS) ON TRICHOCEREUS

CEREUS UNDERSTOCK WITH PLLOCEREUS SCION

TRANSPARENCY DISCUSSION GUIDE

GRAFTING CACTUS

I. Transparency: "CLEFT-GRAFTING OF EPIPHYLLUM ONTO PERESKIA"

1. Cut the understock (frequently a well-rooted Pereskia) at the desired height. Then, make a vertical wedge.
2. Trim the scion (an Epiphyllum) so the base is wedge shaped.
3. Fit the cleft into the stock.
4. Hold the materials together by pinning.

II. Transparency: "CLEFT-GRAFTING OF CHRISTMAS CACTUS ONTO MYRILLIOCACTUS"

1. Slit the Myrilliocactus with a razor blade.
2. Cut a very thin piece from the base of the Christmas Cactus.
3. Insert the Christmas Cactus into the split.
4. Secure with pins or a rubber band.

III. Transparency: "FLAT METHOD OF GRAFTING CACTUS"

Use this method with barrel-like types of cactus in the summer when they are actively growing.

1. Be sure the central rings of the scion and stock match.
2. Frequently, cross sections of cacti are somewhat different.

IV. Transparency: "FLAT METHOD OF GRAFTING CACTUS" (cont.)

1. Cut off horizontally a well-rooted cereus at the desired height.
2. Slice the bottom of the scion (Notocactus).
3. Place them together at once and rub them together gently to eliminate air pockets. Then fasten the scion and stock with sterile pins so they cannot shift.

V. Transparency: "EXAMPLES OF CACTI CLEFT-GRAFTED AND GRAFTED BY THE FLAT METHOD"

1. Christmas Cactus on Trichobereus

2. Christmas Cactus on Opuntia (Prickly Pear)

3. Rat-tail Cactus (Aporocactus) on Trichocereus

4. Ollocerteus on Cereus

5. Notocactus on Trichocereus spachianus

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

PROPAGATING PLANTS BY HERBACEOUS GRAFTING

Multiple Choice

__B__ 1. The best time to graft cactus is

a. when they are flowering.
b. when they are actively growing.
c. when they are dormant.
d. anytime.

__B__ 2. The ____ must match for a graft to "take."

a. cranium
b. cambium
c. cadmium
d. cambrium

__A__ 3. The lower portion of a graft is called the ____.

a. stock
b. callus
c. cristate
d. scion

__D__ 4. Plants are grafted to ____.

a. produce an interesting plant.
b. to match a vigorously growing rootstock with a slower growing scion.
c. save a valuable plant which has lost its roots.
d. all of the above.

__D__ 5. A dull knife is likely to ____.

a. protect the user from injury.
b. produce a poor graft.
c. result in an injury to the user.
d. both (b) and (c).

__C__ 6. When sharpening a grafting knife, the blade should be held at a ____ angle to the stone.

a. 30°
b. 70°
c. 20°
d. 3°

___B___ 7. It is helpful to rub cactus scion and stock together to _____.

a. eliminate any "germs."
b. eliminate air pockets.
c. eliminate sap.
d. both (a) and (b).

___D___ 8. Once grafted, a cactus should be placed

a. in a sunny, cool location.
b. in a shaded, cool location.
c. in a sunny, warm location.
d. in a shaded, warm location.

Essay

9. Explain graft incompatability.

The inability of two different plants to be successfully grafted together into one composite plant.

10. What materials must be sterilized when grafting? Why?

All the tools and materials used in grafting should be sterilized to avoid infection of the graft.

UNIT F: Plant Identification

PROBLEM AREAS:

1. Identifying turfgrasses and turfgrass weeds, and using turfgrasses in the landscape
2. Identifying trees and shrubs in the landscape
3. Identifying vines and ground covers in the landscape
4. Identifying and using annual and perennial flowers in the landscape
5. Identifying and caring for flowering and foliage house plants

UNIT F: PLANT IDENTIFICATION

PROBLEM AREA: IDENTIFYING TURFGRASSES AND TURFGRASS WEEDS AND USING TURFGRASSES IN THE LANDSCAPE

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year students in a horticultural or agricultural occupations program. The recommended time for teaching this problem area is during the spring semester.

The estimated instructional time for this problem area is 6 to 8 days, depending on how far the teacher wishes to go in developing turfgrass and weed identification skills. If the teaching plan is limited to classroom discussion with little or no practice or observation, the instructional period can be 6 days or less. If the students are to be involved in other activity exercises, the instructional time will need to be increased.

The instructor is encouraged to conduct a local search to locate other supplementary materials for use with this problem area. The items in this problem area are for reference or modification as the instructor adapts this problem area to the local situation.

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The teachers' guide, student worksheets, and test questions were developed by Charles Wanner, Lincoln-Way High School, and Ron Biondo, Department of Vocational and Technical Education, University of Illinois. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Field Test Teachers.

TEACHER'S GUIDE

I. Unit: Plant identification

II. Problem area: Identifying turfgrasses and turfgrass weeds and using turfgrasses in the landscape

III. Objectives:

1. Given a sample turfgrass, the student will identify the vegetative characteristics used to recognize turfgrass species.

2. Given samples, the student will identify the following species of turfgrasses: a) Kentucky Bluegrass, b) Tall Fescue, c) Creeping Bentgrass, d) Red Fescue, e) Zoysia-Grass, f) Perennial Ryegrass, g) Annual Ryegrass.

3. Given turfgrass seed samples, the student will identify the seeds of the following species of turfgrasses: a) Kentucky Bluegrass, b) Tall Fescue, c) Creeping Bentgrass, d) Red Fescue, e) Perennial Ryegrass, f) Annual Ryegrass.

4. Given a description of environmental conditions, management practices and intended use of an area, the student will select the most appropriate species or mixture of turfgrasses to use in the situation.

5. Given ten samples of lawn weeds common to Illinois, the student will identify these weeds.

IV. Suggested interest approaches:

1. Compile a list of the situations around the school and community in which turfgrasses are utilized.

2. Bring samples of turfgrass species into the classroom for student observation. Ask the students to compare and contrast the turfgrass characteristics in general terms, and give suggestions for uses of the various species. List class observations on the chalkboard.

3. Tour the school grounds as a class. Students should try to point out as many different types of turfgrasses and weeds as possible. Don't try to name each plant at this stage. Keep a tally of the number of different plants and the locations.

4. Place an enlarged diagram or model of a grass plant before the class. Ask the question: If you were trying to identify this plant, what parts would you examine to make a decision? Keep a list of suggestions or highlight the plant structures mentioned by the students.

5. Mix the seeds of several turfgrass species together in a glass container. Confront the class with the problem of determining the species of turfgrasses that would become established by planting the seed mixture. Ask the student to identify instances in which it would be beneficial to know how to identify turfgrass seed.

6. Grow some common turfgrass weeds in the greenhouse or classroom. Allow the students to examine the samples and attempt to identify the weeds. This activity will provide an opportunity to assess the weed identification abilities of the class.

7. Begin the discussion of this problem area by asking the class the following types of questions:

   a. Do you think it is important to know something about turfgrass identification before you set out to establish or maintain a turf area? Why is it important?

   b. How many of you think that you could tell the difference between a lawn of Kentucky Bluegrass and a lawn of Perennial Ryegrass? What clues would you use to distinguish between the two turfgrass species?

   c. Have you ever taken a close look at a grass plant? What plant parts were you able to see? Could these plant parts help you distinguish between turfgrass species?

   d. How would the ability to identify common turf weeds help you in the management of a turfgrass site?

   e. How many of you have experience in pulling weeds out of a lawn? What types of weeds were you removing from the lawn?

V. Anticipated problems and concerns of students:

Objective I

1. What are the basic parts of a grass plant?

2. How do the plant parts differ in the various turfgrass species?

3. How do you identify a turfgrass species by looking at the vegetative characteristics?

Objective II

1. What are the turfgrass species commonly used in Illinois?

2. What are the vegetative characteristics of these turfgrass species?

Objective III

1. Why is it important to know how to identify the seeds of turfgrasses?

2. What are the distinguishing characteristics that can be used to identify turfgrass seeds?

Objective IV

1. How does climate influence your choice of a turfgrass species?

2. How do soil conditions influence your choice of a turfgrass species?

3. How do you match a turfgrass species with the intended use of a site?

4. Does the amount of shade on a site influence the choice of a turfgrass species?

5. Do you consider the planned management practices for a site when deciding on an appropriate turfgrass species?

6. When should you use a mixture of turfgrass species for establishing turf on a site?

Objective V

1. What are some of the most common lawn weeds found in this area?

2. What are the vegetative characteristics of these weeds?

VI. Suggested learning activities and experiences:

1. Bring samples of turfgrass species into the classroom to be identified. Students can examine turfgrass samples with magnifying lenses and draw diagrams showing the location and name of the vegetative structures used in species identification. Sow seed for this presentation 8 weeks in advance.

2. Students prepare mounts of turfgrass species to be studied in the class. Each mount should include a brief description of the vegetative characteristics which distinguish the species.

3. Conduct a field trip to observe turfgrass species being utilized in a variety of situations. Students should fill out a field trip observation record.

4. Using actual samples, the students may develop a key to help them identify the various turfgrass species.

5. Select areas around the school and community where turfgrasses might be planted. Discuss environmental conditions that exist at each site and determine which turfgrass species would be most appropriate.

6. Have each student collect 10 weeds in the fruiting stage from their lawn. Use the specimens for identification purposes.

7. Have students read assigned materials and answer problems and concerns identified earlier.

8. Show slidefilms listed for this problem area and use the information gained to answer problems and concerns.

VII. Application procedures:

1. The material in this problem area will be applied in the development of turfgrass establishment and maintenance plans.

2. Students will apply their knowledge of plant identification during the establishment of turfgrass demonstration plots or other turfgrass sites.

3. Plant identification skills will be used by students involved in S.O.E. programs that are related to turfgrass management or landscaping.

VIII. Evaluation:

1. Prepare and administer an objective paper-and-pencil test covering the material presented in the problem area.

2. Grade worksheets completed by the students.

3. Conduct a practical identification test using visual samples of turfgrass species and weeds.

4. Grade the plant collections that have been put together by the students.

5. Evaluate student knowledge of turfgrass species through a role-playing situation. The teacher acts as a "customer" interested in establishing and maintaining a turfgrass site under a particular set of conditions. Each student in the class, role plays as a turf specialist in a landscape construction company and makes suggestions for appropriate turfgrass species or mixtures for each situation presented by the "customer."

IX. References and aids:

1. University of Illinois Cooperative Extension Service, Circular 1105, "Turfgrasses of Illinois."

2. North Central Regional Extension Publication No. 16, "Lawn Weeds and their Control."

3. University of Illinois, College of Agriculture, Vocational Agriculture Service.

Slidefilms:

650	"Lawn Weeds - Identification and Control" (39 fr.) (Student Guide and Tape available)
652	"Identifying Illinois Turfgrasses" (65 fr.) (Student Guide available)
S650	"Lawn Weeds - Identification and Control"
S652	"Identifying Illinois Turfgrasses" (63 fr.) (Student Guide available)
653	"Seed Structure and Identification of Cool Season Turfgrasses" (62 fr.)

INFORMATION SHEET

SUGGESTED TURFGRASSES AND WEEDS FOR IDENTIFICATION

Turfgrasses

1. Kentucky Bluegrass
2. Annual Bluegrass
3. Creeping Bentgrass
4. Red Top
5. Perennial Ryegrass
6. Annual Ryegrass
7. Tall Fescue
8. Bermuda Grass
9. Red Fescue
10. Zoysiagrass

Weeds

1. Crabgrass
2. Silver Crabgrass
3. Yellow Foxtail
4. Fall Panicum
5. Nimble Will
6. Bermuda Grass
7. Quackgrass
8. Nutsedge
9. Broadleaf Plantain
10. Buckhorn Plantain
11. Dandelion
12. Chickory
13. Bull Thistle
14. Ground Ivy
15. Curly Dock
16. Henbit
17. Mallow
18. Yarrow
19. Mouse Ear Chickweed
20. Common Chickweed
21. Knotweed
22. Purslane
23. Carpet Weed
24. Wild onion

STUDENT WORKSHEET

FIELD OBSERVATION OF TURFGRASS SPECIES

Name_____ Date_____

Location_____

1. Type of turf area:

Home Lawn ___
Athletic Field ___
Highway Turf ___
Park ___

Golf Green ___
Golf Tee ___
Golf Fairway ___
Other (Specify)___

2. Soil and site characteristics:

Soil Texture_____

Soil Drainage
- Well Drained ___
- Moderately Drained ___
- Poorly Drained ___

Soil pH ____

Topography (Slope)_____

Exposure to sun
- Open sun ___
- Partial shade ___
- Shade ___

Traffic
- Heavy ___
- Moderate ___
- Light ___

3. Turfgrass characteristics:

Turfgrass Species or Mixture_____

Growth Habit
- Stoloniferous
- Bunch-Type ___
- Rhizomatous ___

Structural Characteristics
- Leaf Blade_____
- Auricle_____
- Ligule_____
- Color_____

Turf Coverage
- Dense ___
- Moderate ___
- Thin ___

4. Cultural practices:

Intensity of Management
High ___
Moderate ___
Low ___

Mowing Height_____

Fertility Practices
Analysis_____
Rate_____
Frequency of
Application_____

Lime Application
Type_____
Rate_____
Frequency_____

Irrigation Practices
_____
_____
_____

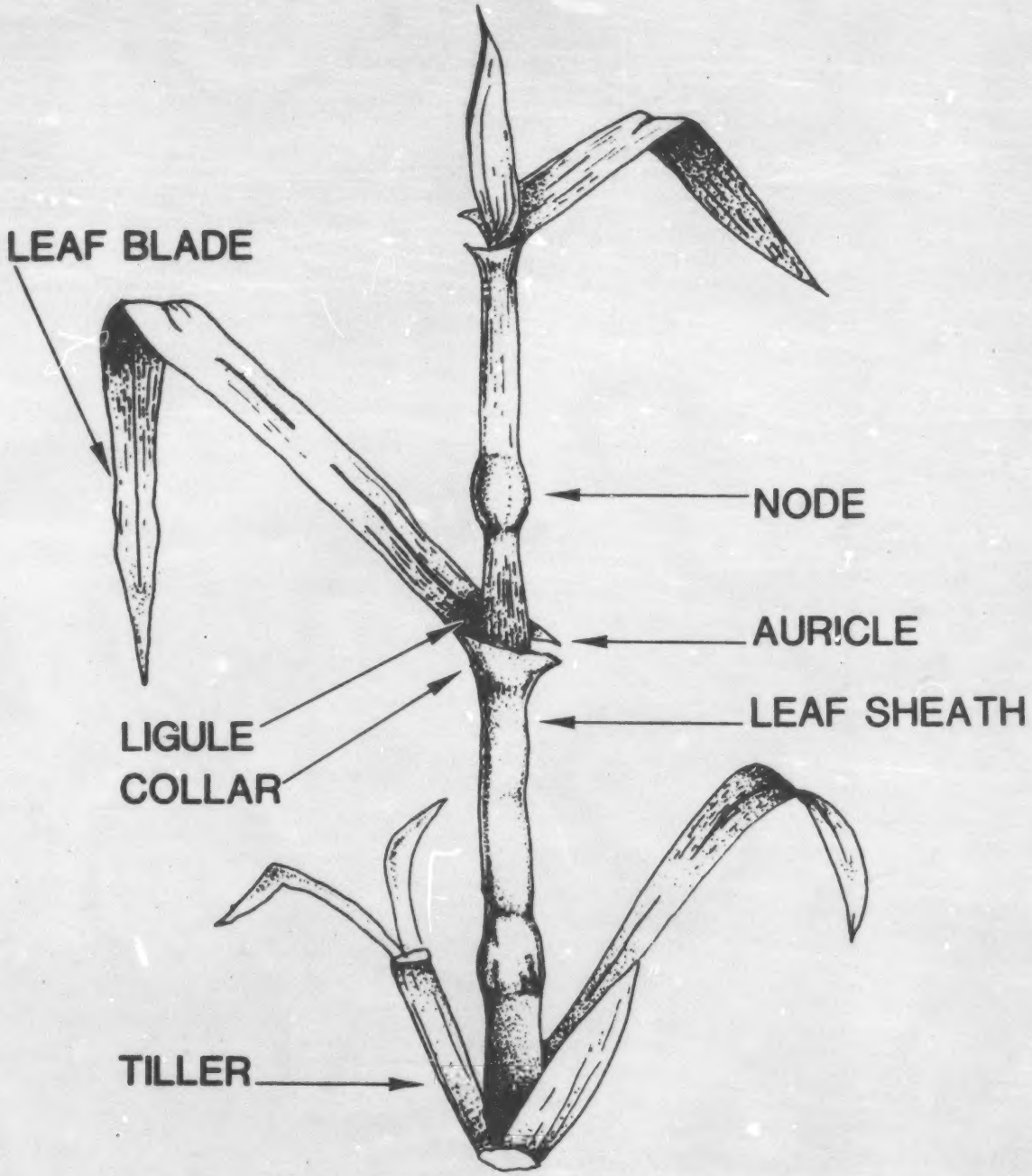
Pest Control (Weeds, Insects, Diseases)
Pesticides_____
Time of
Application_____

STUDENT WORKSHEET

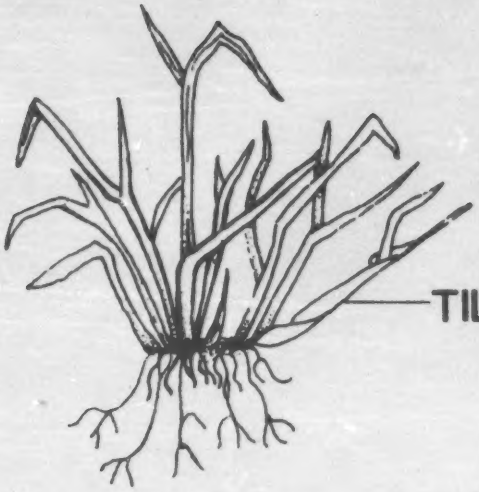
TURFGRASS SPECIES IDENTIFICATION

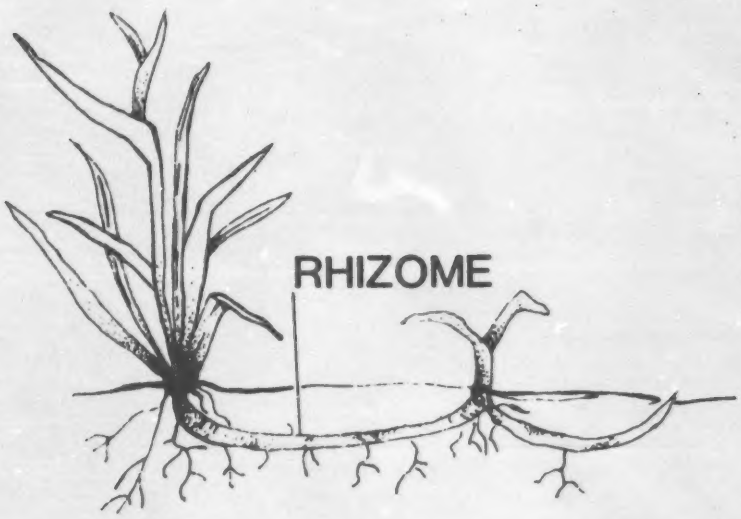
Turfgrass Species Name	Plant Structures			Season Classification Cool or Warm	Growth Habit			Environmental Adaption and Common Uses
	Ligule	Auricle	Leaf Blade		Stolon,	Rhizome,	Bunch	

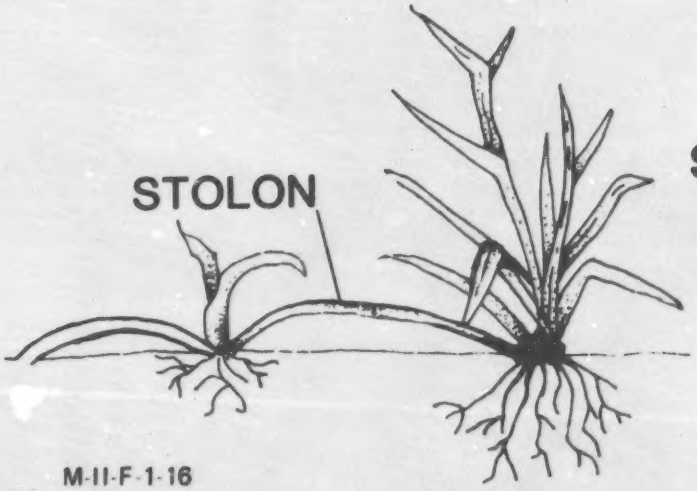
PARTS OF A GRASS PLANT



TURFGRASS GROWTH HABITS







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TURFGRASS PLANT STRUCTURES

TIPS OF LEAF BLADES

TAPERED

LINEAR

BOAT-SHAPED

AURICLES

CLAW-LIKE

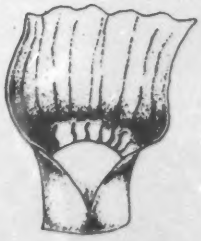
ROUNDED

ABSENT

LIGULES

SMOOTH MEMBRANE

JAGGED MEMBRANE



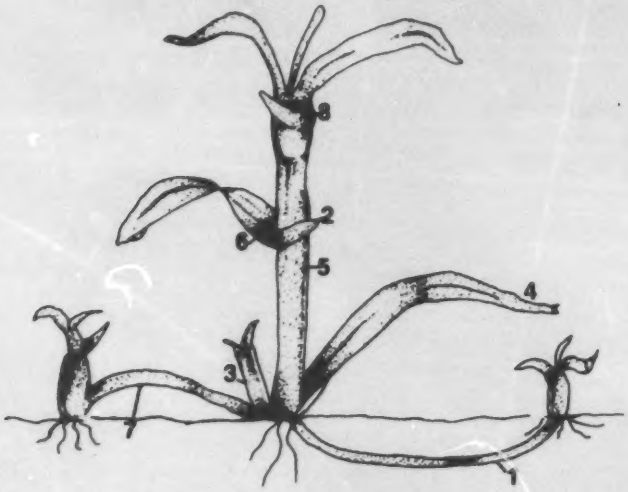
FRINGE OF HAIRS

M-II-F-1-17

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

IDENTIFYING TURFGRASSES AND TURFGRASS WEEDS AND USING TURFGRASSES IN THE LANDSCAPE

1. Match the structure name to the numbered plant parts on this diagram of a grass plant.



	Structure Names
1. F	A. Tiller
2. D	B. Leaf Blade
3. A	C. Stolon
4. B	D. Auricle
5. H	E. Collar
6. G	F. Rhizome
7. C	G. Ligules
8. E	H. Leaf Sheath

2. Name the 3 growth habits exhibited by turfgrass species.

   1. Rhizomatous
   2. Stoloniferous
   3. Bunch-type

3. Label the following turfgrass species as cool season or warm season.

1. Kentucky Bluegrass	Cool	4. Tall Fescue	Cool
2. Perennial Ryegrass	Cool	5. Red Fescue	Cool
3. Creeping Bentgrass	Cool	5. Zoysiagrass	Warm

4. Choose an appropriate turfgrass species to fit the following environmental and cultural conditions

   A. A lawn that is open to the sun and level. The soil is moist, well-drained and fertile. The lawn will be maintained under moderate to high levels of fertilization and mowed to moderate heights. (1.5 - 2.5")

      Turfgrass Species - Kentucky Bluegrass

B. A putting green on a golf course. The cultural practices for this turfgrass site include close and frequent mowing (¼" or less) regular applications of fungicide for disease control, frequent irrigation, and some cultivation or top dressing.
Turfgrass Species - Creeping Bluegrass

C. A turfgrass species for a roadside area. The species chosen should have a good resistance to heat, drought and wear. This site will receive a low level of maintenance.
Turfgrass Species - Tall Fescue

5. Match the turfgrass species name with the appropriate characteristic.

Species Name	Characteristics
1 A. Kentucky Bluegrass	1. Principal turfgrass in Illinois
2 B. Creeping Bentgrass	2. Requires intensive cultural practices
5 C. Tall Fescue	3. Warm season grass that forms dense turf
6 D. Red Fescue	4. Germinates quickly and provides rapid cover
3 E. Zoysiagrass	5. Coarse textured grass often used for pasture
4 F. Perennial Ryegrass	6. Fine, wiry, dark green turfgrass that does well on poor or drouthy soils

6. Why wouldn't a bentgrass be a good choice for your home lawn?

It requires a high level of management.

7. Name the 3 basic groups of weeds that might cause problems in a turfgrass area.

1. Grasses
2. Broadleaves
3. Sedges

8. Match the life span group name with the appropriate definition.

a. Annual b. Biennial c. Perennial

1. C A plant that lives for more than two years.

2. A A plant that germinates from seed, grows, matures and dies in less than 12 months or when killed by frost.

3. B A plant that requires two years to complete the life cycle.

9. Identify the ten common lawn weeds shown in the numbered samples.

10. Identify the six turfgrass species shown in the numbered samples.

11. Identify each of the six turfgrass seed samples that are displayed on the table in the classroom.

12. Name the two types of vegetative reproduction pictured below:

1. Rhizomatous 2. Stoloniferous

__B__ 13. Perennial Ryegrass is an example of a bunch-type grass. A bunch grass reproduces by:

A. Rhizomes
B. Basal Tillers
C. Stolons
D. None of these

14. Name 3 plant structures that would help you identify a turfgrass species:

1. Auricles
2. Ligules
3. Leaf blade

15. List the names of six turfgrass species that are commonly used in Illinois:

1. Kentucky Bluegrass
2. Perennial Ryegrass
3. Red Fescue
4. Tall Fescue
5. Zoysiagrass
6. Creeping Bentgrass

UNIT F: PLANT IDENTIFICATION

PROBLEM AREA: IDENTIFYING TREES AND SHRUBS IN THE LANDSCAPE

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year students in a horticultural or agricultural occupations program. The recommended time for teaching this problem area is during the early fall. Students interested in competing in the State Ornamental Horticulture Judging Contest, the Illinois 4-H Horticulture Judging Contest, or the National Junior Horticulture Judging Contest may need to cover plants not listed in this problem area. Refer to the appropriate contest rule booklets for more information.

The estimated instructional time for this problem area is 5 to 12 days, depending on how far the teacher wishes to go in developing identification and selection skills at the second-year level. If the teaching plan is limited to classroom discussion with little or no practice or observation, the instruction can be 5 days or less. If the students are to be involved in other activity exercises, the instructional time will need to be increased.

The instructor is encouraged to conduct a local search to locate other supplementary materials for use with this problem area. The items in this problem area are for reference or modification as instructors adapt this problem area to their local situation.

CREDIT SOURCES:

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The teacher's guide, student worksheets, and test questions were developed by Ron Biondo, Department of Vocational and Technical Education, University of Illinois. Transparency masters and the transparency discussion guide were prepared by Vocational Agriculture Service, University of Illinois. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Field Test Teachers.

TEACHER'S GUIDE

I. Unit: Plant identification

II. Problem area: Identifying trees and shrubs in the landscape

III. Objectives: At the close of this problem area, the student will be able to:

1. Identify 25 major Illinois trees by common name.
2. Identify 15 conifers by common name.
3. Identify 15 shrubs most commonly used in landscaping by their common name.
4. Select trees and shrubs for various environmental conditions.
5. Identify the vegetative characteristics used to recognize trees and shrub species.

IV. Suggested interest approaches:

1. Have a local forester or horticulturist visit the class and have them identify the common trees and shrubs they encounter in their profession. Emphasis should be on the most common plant materials.
2. Ask the students to name the trees and shrubs which are growing in their home landscape. Have them bring in leaf or branch specimens of those plants and identify these plants in class.
3. Ask the question, "Why is it important to be able to identify trees and shrubs correctly?"
4. Visit an arboretum or a botanical garden to identify trees and shrubs.

V. Anticipated problems and concerns of students:

1. What is a deciduous tree or shrub?
2. What is a compound leaf?
3. What is meant by the term "evergreen?"
4. Can a narrow leaf "conifer" be deciduous?
5. How can trees be identified during the months when leaves are not present?

6. What are the major characteristics to look for when identifying trees and shrubs?

7. What are opposite buds?

8. How do pines, firs, spruce, and junipers differ?

9. How do needles and scales differ?

10. What is the growth habit of a plant?

11. Does the growth habit of a plant change with the age of the plant?

12. How do growth habits help in distinguishing shrubs?

13. When is a shrub considered a small tree?

14. Do all trees and shrubs grow under the same conditions?

15. What is a cone?

16. Do growth habits of pines change with time?

VI. Suggested learning activities and experiences:

1. Discuss the terminology used when identifying trees and shrubs.

2. Have the students complete the worksheets included with the problem area.

3. Show slides on tree identification and describe specific tree characteristics.

4. Take a walk in the neighborhood and identify trees and shrubs by their growth habit, bark, leaf shape, fruit, and buds.

5. Have the students collect and correctly identify leaves and twigs from 10 different trees.

6. Have the students collect and correctly identify leaves and twigs from 15 different shrubs.

7. Obtain and use a tree and shrub identification key. You may make up one for the school grounds as a simplified version of a more complete key.

8. Show slides on identification of conifers, small shrubs, medium shrubs, large shrubs or small trees, and shade trees. Discuss the characteristics of a selected group of plants they will likely need to become familiar with in a horticulture business.

9. Take a field trip to an arboretum or local garden center and review plant material commonly used and sold in your area.

10. Split the class or club into teams and have them compete in a plant materials scavenger hunt. Use Job Sheet included with this problem area.

11. Develop the school landscape by obtaining the plant materials discussed in class and planting them.

12. Have the students prepare a tree and shrub fall color list.

13. Participate in the local, regional, and State FFA and National Junior Horticulture Judging Contests.

14. Have the students make a list of all the ornamental (woody) plants grown at home.

15. Discuss how plant identification can be a part of the subject for a supervised occupational experience program.

16. Have each student keep a plant diary on a specific tree or shrub.

VII. Application procedures:

1. Plants must be correctly identified in order to meet the proper cultural requirements of the plants.

2. Identification skills can be put to use when selecting landscape plants.

3. Identification skills will aid students working at garden centers, nurseries, parks, arboretums, florists, landscaping firms, etc.

VIII. Evaluation:

1. Collect and evaluate worksheets.

2. Administer quizzes upon the completion of each I.D. Section (i.e., trees, evergreens, and shrubs). Split the class into teams and record scores for both individual and team performance. Reward the best team and individual scorers by letting them compete in regional or state competition.

3. Prepare and administer an objective pencil and paper test using Sample Test Questions and laboratory specimens.

IX. References and aids:

1. Manual of Woody Landscape Plants, M. A. Dirr, Stipes Publishing Co., Champaign, Illinois. Copyright, 1975.

2. Slidefilms or Slide Sets produced by Vocational Agriculture Service, University of Illinois.

504	"Identifying Coniferous Trees"	59 Frames
616	"Selecting Trees for Landscape Use"	48 Frames
660	"Recognizing Small Shrubs"	35 Frames
660-1.2	"Recognizing Small Shrubs" - Pt. 2	32 Frames
661	"Recognizing Medium Size Shrubs"	37 Frames
662	"Recognizing Large Shrubs & Small Trees"	38 Frames
662-1.2	"Recognizing Large Shrubs" - Pt. 2	55 Frames
681	"Selecting Container Evergreens"	39 Frames
682	"Selecting Container Evergreens"	28 Frames
683	"Selecting Container Evergreens"	23 Frames
S636	"Tree Identification"	200 Frames

3. Subject-Matter Units produced by Vocational Agriculture Service, University of Illinois

5001	"Selecting Trees for Home Planting"	40 pages
5022	"Using Coniferous Evergreens in a Landscape"	

4. Plant Diary included in Core I and available from Vocational Agriculture Service.

5. Information Sheet: "Partial Listing of Regional Botanical Gardens and Arboreta."

6. Job Sheet: "Scavenger Hunt Guidelines."

INFORMATION SHEET

PARTIAL LISTING OF REGIONAL BOTANIC GARDENS AND ARBORETA

ILLINOIS

Botanic Garden of the Chicago Horticultural Society

P.O. Box 400
Glencoe, Illinois 60022
Dr. Louis B. Martin, President
(312) 835-5440

Edwardsville Campus Arboretum

Southern Illinois University
Edwardsville, Illinois 62025
Paul Owens
(618) 692-2719

Arboretum in planning stage.

Garfield Park Conservatory

300 North Central Park Boulevard
Chicago, Illinois 60624
Dr. Charles E. Ackerman
(312) 533-1281

4.5 acres of conservatories; open daily 9-5; during flower shows 9-9.

Lincoln Park Conservatory

2400 North Stockton Drive
Chicago, Illinois 60614
Walter Edens, General Foreman
(312) 294-4770

3 acres of conservatories; open daily daylight hours.

Morton Arboretum

Route 53
Lisle, Illinois 60532
Dr. Marion T. Hall
(312) 968-0074

1500 acres; open daily daylight hours. Crab-apples, lilacs, conifers, hedges, street trees, ground covers.

INDIANA

Hayes Regional Arboretum

801 Elks Road
Richmond, Indiana 47374
Donald R. Hendricks, Director
(317) 962-3745

300 acres; open daily 1-5. Closed Mondays, Christmas, New Year's, September 1-15. No admission charge. 181 native woody plants exhibited. Solar greenhouse open to visitors.

IOWA

Bickelhaupt Arboretum

340 South 14th Street
Clinton, Iowa 52732
Robert E. & Frances K. Bickelhaupt, Directors
(319) 242-4771

11 acres; nature trail, ¼ acre prairie, tropical planting display. Open daily dawn to dusk year-round. No charge.

MISSOURI

Missouri Botanical Gardens

2345 Tower Grove Avenue
St. Louis, Missouri 63110
Dr. Peter Raven
(314) 772-7600
60 acres in St. Louis; open daily. Orchids, tropical plants, climatron, succulents.

WISCONSIN

University of Wisconsin Arboretum

1207 Seminole Highway
Madison, Wisconsin 53711

1200 acres, 100 in horticultural collections: lilacs, crabapples, viburnums, hardy trees, and shrubs. 1100 acres in natural and restored Wisconsin plant communities. Open daily, daylight hours.

WISCONSIN (cont'd.)

Mitchell Park Horticultural Conservatory

524 South Layton Boulevard
Milwaukee, Wisconsin 53215
Stephen M. Gaydos, Horticulture Director
(414) 278-4384

Open daily; admission charge; three 80-ft. glass domes featuring tropical, arid, and seasonal floral displays.

STUDENT WORKSHEET

TERMINOLOGY USED IN IDENTIFYING TREES AND SHRUBS

Directions: With resources provided by the instructor and your class notes, match the term with the description of that term.

1. _____ Genus
2. _____ Alternate
3. _____ Deciduous
4. _____ Compound Leaf
5. _____ Entire
6. _____ Species
7. _____ Fascicle
8. _____ Leaflet
9. _____ Lobe
10. _____ Node
11. _____ Cultivar
12. _____ Opposite
13. _____ Evergreen
14. _____ Palmate
15. _____ Petiole
16. _____ Simple Leaf
17. _____ Whorl
18. _____ Pinnate
19. _____ Serrate
20. _____ Sinus

A. The joint on a stem
B. Cluster, as with needles of pine
C. Loses leaves in the fall
D. Fan-like, from a common point
E. Leaf stalk
F. The space between two lobes
G. Variety
H. Leaves stay green year round
I. Not compound
J. A leaf with two or more leaflets
K. Without teeth
L. Two leaves or stems at a node
M. Sawtoothed
N. A projecting portion of a leaf
O. An arrangement of leaves not whorled or opposite
P. Segments along each side of a common axis
Q. Arrangement of 3 or more structures at a single node
R. Foliar element or a compound leaf
S. First word in a Latin name
T. Second word in a Latin name

STUDENT WORKSHEET

IDENTIFYING TREES

I. Introduction:

The purpose of this exercise is to provide a means of organizing tree and shrub identification characteristics.

II. Objective:

At the conclusion of this exercise, students will be able to give the correct common names to selected trees by observing growth habits, twig, leaf, bark, and fruit characteristics.

III. Procedure:

The teacher should select trees on the worksheets to be taught in class. Not all areas in Illinois have these species, so it may be necessary to make substitutions.

While looking at an actual tree, record its distinguishing characteristics, along with the common name, next to the leaf drawing that best matches the plant.

Tree List

Page 14

Betula papyrifera	Paper Birch
Acer saccharinum	Silver Maple
Ulmus americana	American Elm

Page 15

Quercus alba	White Oak
Acer saccharum	Sugar Maple

Page 16

Platanus occidentalis	American Sycamore
Quercus palustris	Pin Oak

Page 4

Celtis occidentalis	Common Hackberry
Aesculus hippocastanum	Common Horsechestnut

Page 18

Tilia americana	American Linden
Gleditsia triacanthos	Common Honeylocust

Page 19

Tilia cordata	Littleleaf Linden
Liriodendron tulipifera	Tuliptree

Page 20

Malus sp.	Crabapple
Fraxinus pennsylvanica	Green Ash

Page 21

Cercis canadensis	Eastern Redbud
Acer rubrum	Red Maple

Page 22

Liquidambar styraciflua	American Sweetgum
Quercus rubra	Northern Red Oak

Page 23

Populus deltoides	Eastern Cottonwood
Pyrus calleryana "Bradford"	Bradford Callery Pear
Ginkgo biloba	Ginkgo

Page 24

Catalpa speciosa	Northern Catalpa
Fraxinus americana	White Ash

Page 25

Sorbus aucuparia	European Mountainash
Salix alba	White Willow

Page 26

Acer platanoides	Norway Maple
Magnolia soulangiana	Saucer Magnolia

Page 27

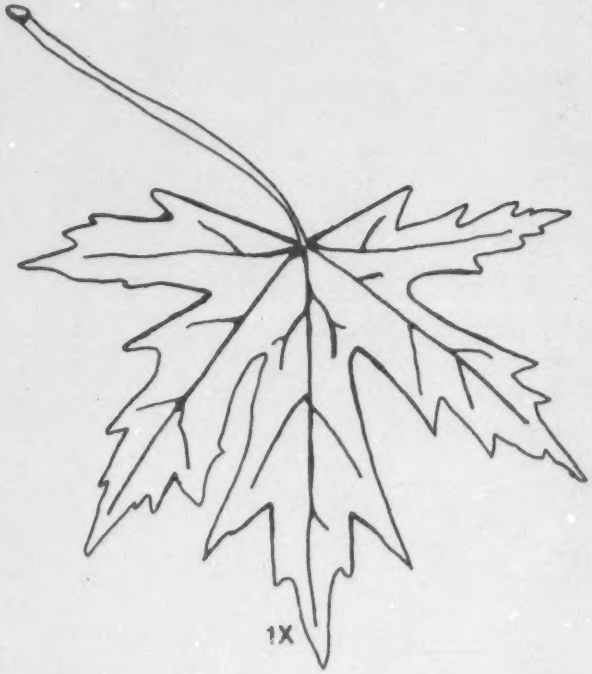
Juglans nigra	Black Walnut
Fagus sylvatica	European Beech

STUDENT WORKSHEET

TREE LEAVES

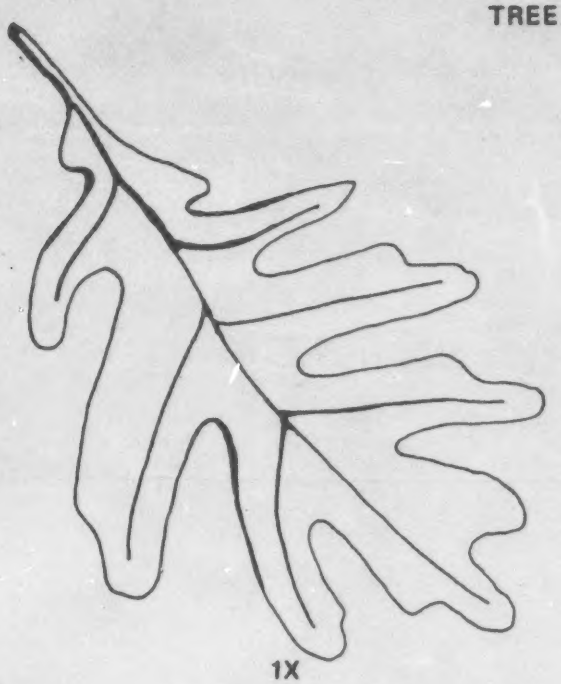
Tree Name:
Bark Characteristics:
Leaf Characteristics:
Fall Color:
Size:
Culture:
Additional Notes:

Tree Name:
Bark Characteristics:
Leaf Characteristics:
Fall Color:
Size:
Culture:
Additional Notes:



Tree Name:
Bark Characteristics:
Leaf Characteristics:
Fall Color:
Size:
Culture:
Additional Notes:

TREE LEAVES



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Tree Name:

Bark Characteristics:

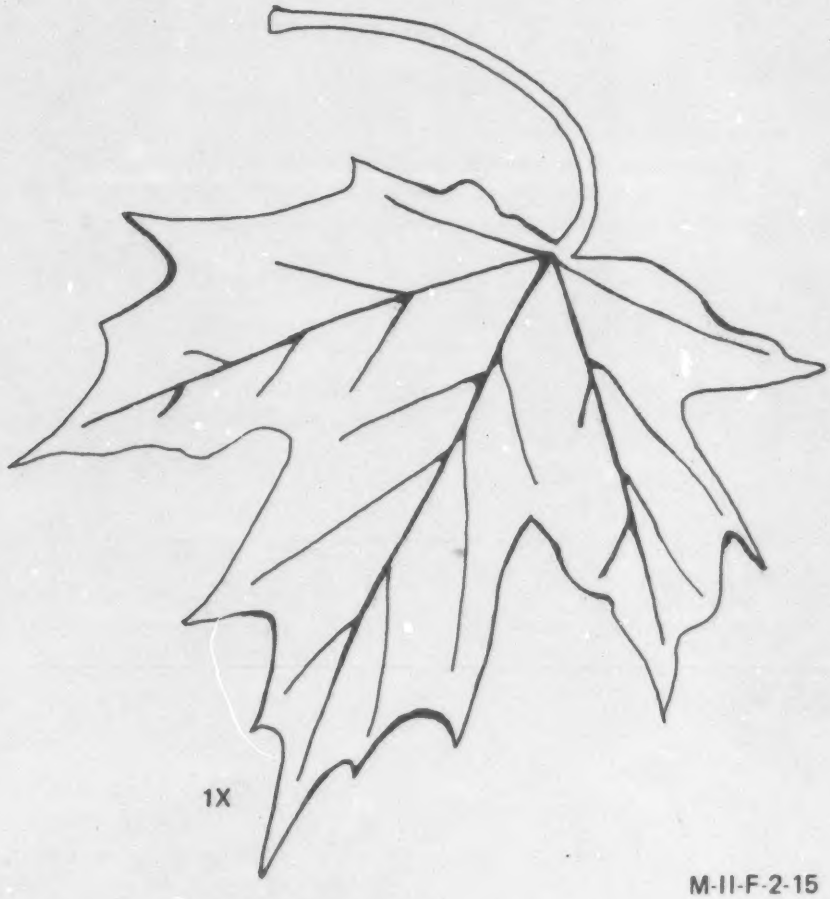
Leaf Characteristics:

Fall Color:

Size:

Culture:

Additional Notes:



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Tree Name:

Bark Characteristics:

Leaf Characteristics:

Fall Color:

Size:

Culture:

Additional Notes:

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TREE LEAVES

1/2X

Tree Name:

Bark Characteristics:

Leaf Characteristics:

Fall Color:

Size:

Culture:

Additional Notes:

1X

Tree Name:

Bark Characteristics:

Leaf Characteristics:

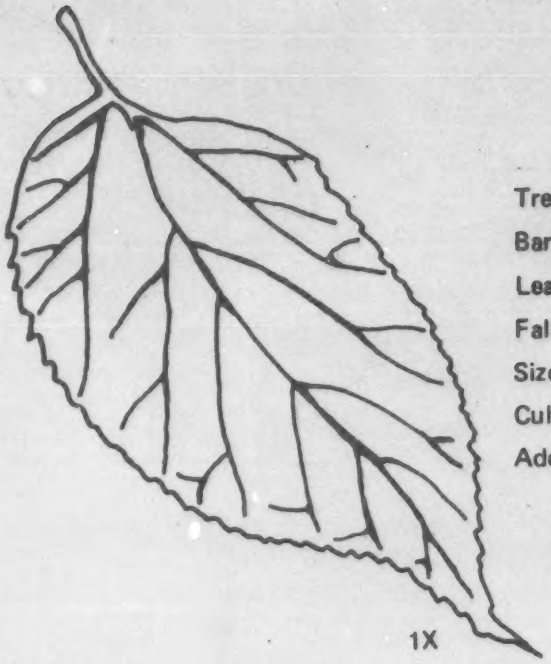
Fall Color:

Size:

Culture:

Additional Notes:

TREE LEAVES



1X

Tree Name:

Bark Characteristics:

Leaf Characteristics:

Fall Color:

Size:

Culture:

Additional Notes:

Tree Name:

Bark Characteristics:

Leaf Characteristics:

Fall Color:

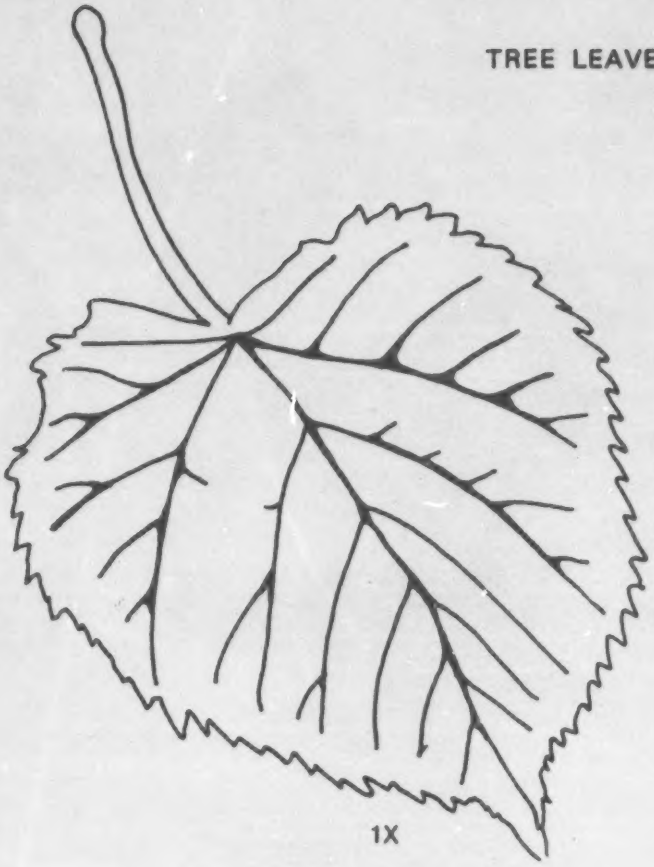
Size:

Culture:

Additional Notes:

1/2X

TREE LEAVES



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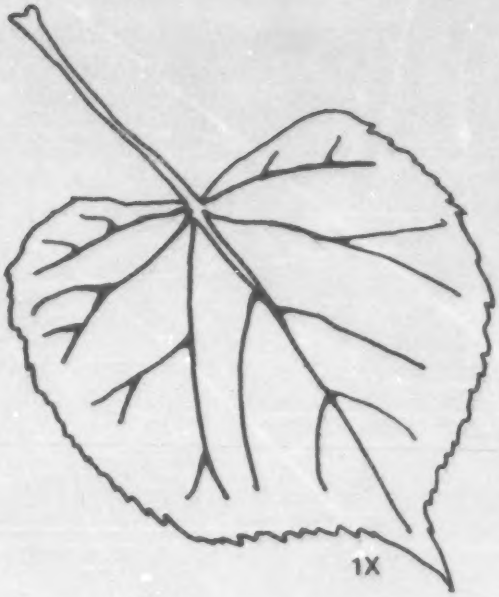
TREE LEAVES



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TREE LEAVES

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TREE LEAVES

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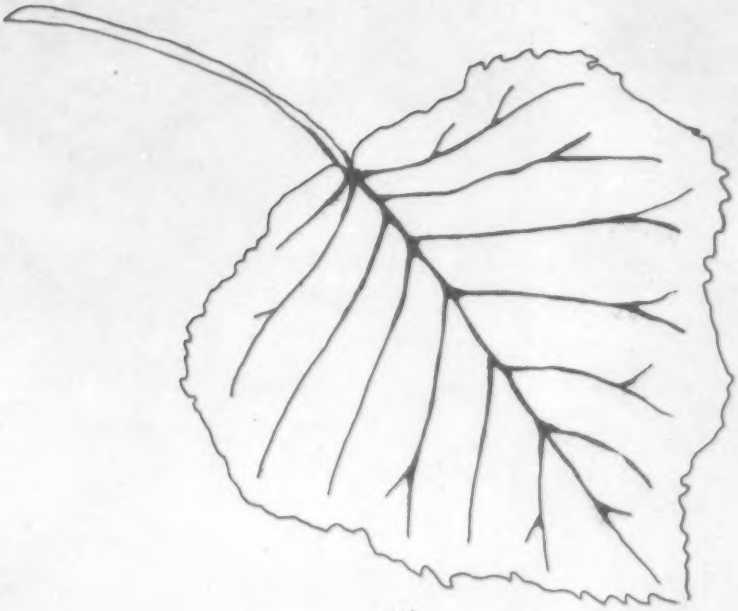

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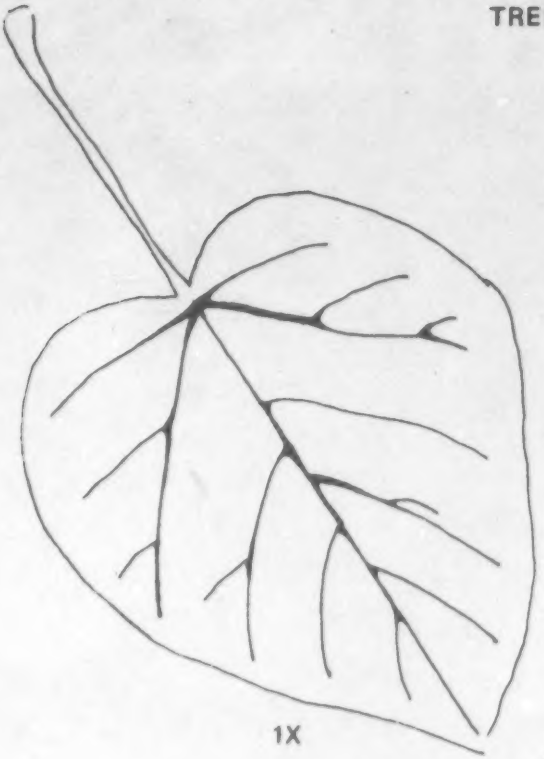
TREE LEAVES



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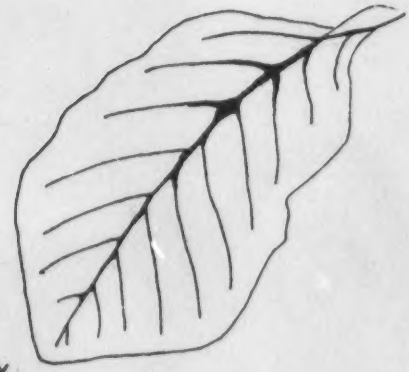

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STUDENT WORKSHEET

IDENTIFYING SHRUBS

I. Introduction:

The purpose of this exercise is to provide a means of organizing shrub identification characteristics.

II. Objective:

At the conclusion of this exercise, students will be able to correctly give common names to selected shrubs by observing growth habits, twig, leaf, bark, and fruit characteristics.

III. Procedure:

The teacher should select shrubs on the worksheets to be taught in class. Not all areas in Illinois have these species, so it may be necessary to make substitutions.

While looking at an actual shrub, record its distinguishing characteristics, along with the common name, next to the leaf drawing that best matches the plant.

Shrub List

Page 30

Berberis thunbergi	Japanese Barberry
Cotoneaster lucida	Hedge Cotoneaster
Cornus stolonifera	Redosier Dogwood

Page 31

Euonymus alatus "Compactus"	Dwarf Winged Euonymus
Forsythia sp.	Forsythia
Ligustrum amurense	Amur Privet

Page 32

Lonicera tatarica	Tatarian Honeysuckle
Potentilla fructicosa	Bush Cinquefoil
Ribes alpinum	Alpine Currant

Page 33

Spiraea prunifolia	Bridalwreath Spirea
Syringa vulgaris	Common Lilac
Viburnum carlesi	Koreanspice Viburnum

Shrub List (cont'd.)

Page 34

Philadelpus coronarius	Sweet Mockorange
Chaenomeles speciosa	Common Flowering Quince
Weigela florida	Old Fashioned Weigela

STUDENT WORKSHEET

SHRUB LEAVES

Shrub Name:

Leaf Characteristics:

Fall Color:

Size:

Culture:

Additional Notes:

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Shrub Name:

Leaf Characteristics:

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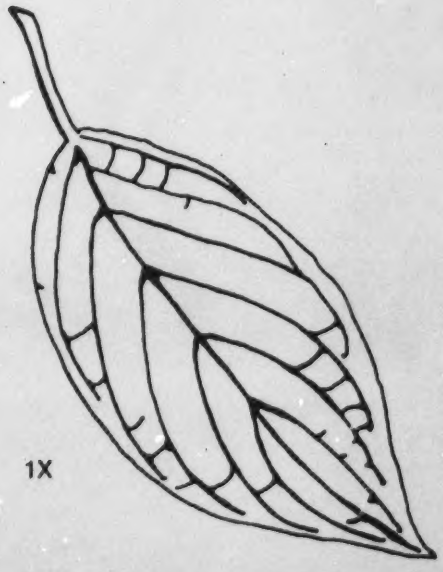

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SHRUB LEAVES

Shrub Name:

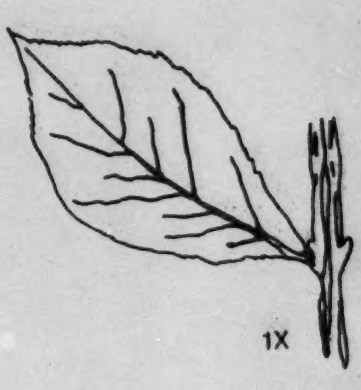
Leaf Characteristics:

Fall Color:

Size:

Culture:

Additional Notes:



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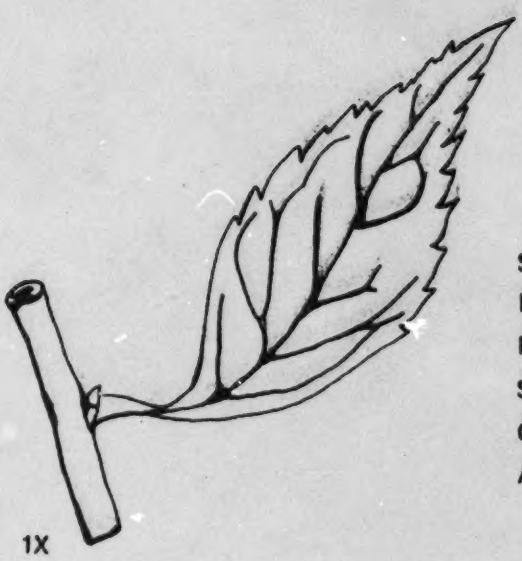

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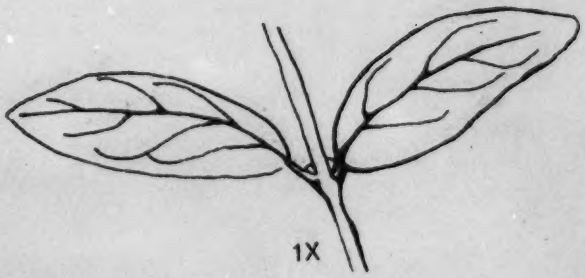

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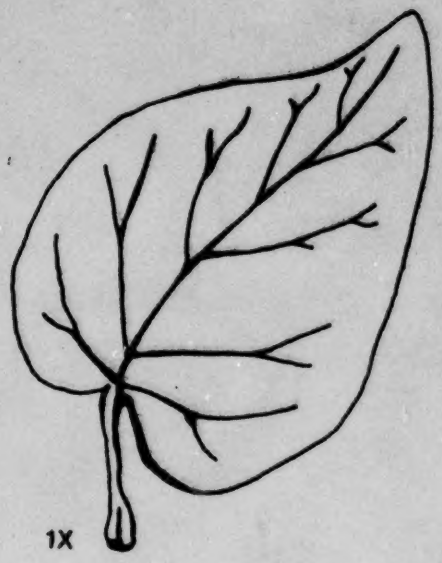

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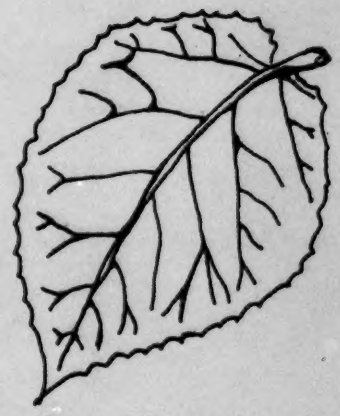

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Shrub Name:

Leaf Characteristics:

Fall Color:

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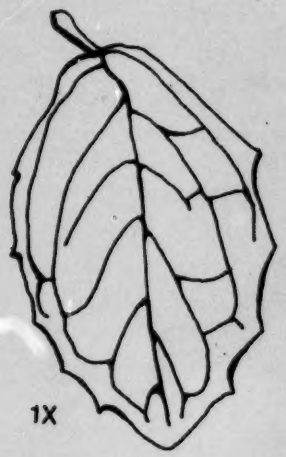

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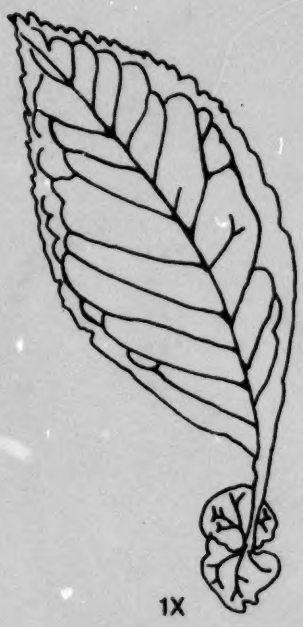

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Shrub Name:

Leaf Characteristics:

Fall Color:

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Shrub Name:

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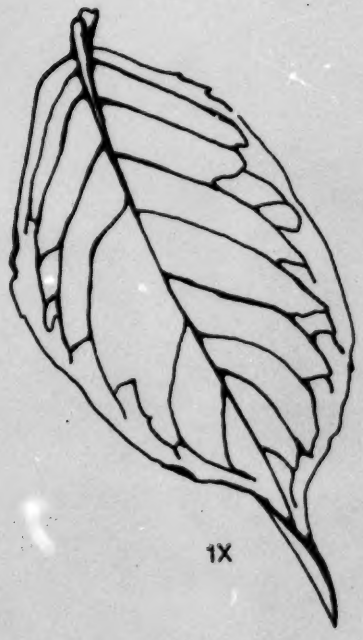

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STUDENT WORKSHEET

IDENTIFYING CONIFEROUS TREES AND SHRUBS

I. Introduction:

The purpose of this exercise is to provide a means of organizing coniferous tree and shrub identification characteristics.

II. Objective:

Upon completion of this exercise, students will be able to identify by name selected coniferous trees and shrubs.

III. Procedure:

When observing a coniferous tree or shrub, record the identification features along with the common names.

Suggested Conifers

Aborvitae, Eastern	Thuja occidentalis
Baldcypress, Common	Taxoduim distichum
Douglasfir	Pseudotsuga menziesii
Balsam Fir	Abies balsamea
Juniper, Andorra Creeping	Juniperus horizontalis "Plumosa"
Juniper, Pfitzer Chinese	Juniperus chinesis "Pfitzeriana"
Larch, European	Larix decidua
Pine, Eastern White	Pinus strobus
Pine, Scotch	Pinus sylvestris
Redcedar, Eastern	Juniperus virginiana
Spruce, Blue Colorado	Picea pungens "Glauca"
Spruce, Norway	Picea abies
Yew	Taxus sp.

M-II-F-2-36

IDENTIFYING CONIFEROUS TREES AND SHRUBS

PLANT NAME	LEAF CHARACTERISTICS	GROWTH HABIT AND SIZE	CONE	ADDITIONAL NOTES

JOB SHEET

SCAVENGER HUNT GUIDELINES

Purpose:

This is an exercise in identifying various trees, shrubs, and conifers.

Procedure:

Divide the class into groups of 3-4 students. Provide a list of materials to be collected by each group. The suggested time limit for the hunt is the time allotted for one period of classroom instruction.

The first group to gather the items and return to the class is the winner. Awards such as house plants or food may be offered to provide incentive.

Example List:

1 leaf of a Red Maple

1 palmately compound leaf of any kind

1 cone from a Norway Spruce

1 acorn from a White Oak

1 leaf of a Hackberry displaying Hackberry Nipple Gall

1 fascicle of five needles

1 fruit structure from a Sweetgum

TEACHER'S KEY TO STUDENT WORKSHEET

TERMINOLOGY USED IN IDENTIFYING TREES AND SHRUBS

Directions: With resources provided by the instructor and your class notes, match the term with the description of that term.

1. S Genus
2. O Alternate
3. C Deciduous
4. J Compound Leaf
5. K Entire
6. T Species
7. B Fascicle
8. R Leaflet
9. N Lobe
10. A Node
11. G Cultivar
12. L Opposite
13. H Evergreen
14. D Palmate
15. E Petiole
16. I Simple Leaf
17. Q Whorl
18. P Pinnate
19. M Serrate
20. F Sinus

A. The joint on a stem
B. Cluster, as with needles of pine
C. Loses leaves in the fall
D. Fan-like, from a common point
E. Leaf stalk
F. The space between two lobes
G. Variety
H. Leaves stay green year round
I. Not compound
J. A leaf with two or more leaflets
K. Without teeth
L. Two leaves or stems at a node
M. Sawtoothed
N. A projecting portion of a leaf
O. An arrangement of leaves not whorled or opposite
P. Segments along each side of a common axis
Q. Arrangement of 3 or more structures at a single node
R. Foliar element or a compound leaf
S. First word in a Latin name
T. Second word in a Latin name

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

IDENTIFYING TREES AND SHRUBS IN THE LANDSCAPE

Fill in the Blanks:

1. Crabapples are small landscape trees which display attractive flowers in the spring and colorful fruits from late summer to winter.

2. A large tree having leaves with many rounded lobes and sinuses and bearing acorns is a White Oak .

3. A large shrub having red stems is a Redosier Dogwood .

4. A large coniferous tree with circular leaf scars and frequently used as a Christmas tree is Balsam Fir .

5. A large shrub with white or lavender flowers is Lilac .

True (+) False (-):

+ 1. Pin Oaks have a strongly pyramidal growth habit.

+ 2. Witches brooms are commonly found on Hackberry.

- 3. Honeylocust has compound palmate leaves.

+ 4. Hedge Cotoneaster is a large shrub with yellow to red fall color.

- 5. Potentilla has bright blue flowers borne in summer.

+ 6. Douglasfir bears distinctive cones in that the bracts extend beyond the scales.

+ 7. Eastern Redcedar is an evergreen tree with scale-like foliage.

- 8. Old Fashioned Weigela displays white flowers in spring.

+ 9. Koreanspice Viburnum has fragrant flowers.

+ 10. Tatarian Honeysuckle has opposite buds.

Multiple Choice:

D 1. Which of the following trees have opposite buds?

A. Sugar Maple
B. American Elm
C. Green Ash
D. Both A and C
E. Both B and C

C 2. Which tree has compound leaves?

A. Paper Birch
B. Littleleaf Linden
C. Horsechestnut
D. American Sycamore

D 3. Which tree has distinctively ornamental bark?

A. Hackberry
B. Tuliptree
C. Honeylocust
D. Paper Birch

C 4. Which tree is not known for good fall coloration?

A. Ginkgo
B. Paper Birch
C. American Linden
D. Sugar Maple

A 5. _____ is an excellent barrier because of its small sharp thorns.

A. Japanese Barberry
B. Lilac
C. Alpine Currant
D. Potentilla

B 6. Which shrub does not have opposite leaves?

A. Dwarf Winged Euonymus
B. Forsythia
C. Koreanspice Viburnum
D. Amur Privet

B 7. _____ is an evergreen shrub displaying a seed encased in red fleshy material.

A. Pfitzer Juniper
B. Yew
C. Douglasfir
D. Arborvitae

C 8. This evergreen tree has orange bark.

A. Andorra Juniper
B. Norway Spruce
C. Scotch Pine
D. Eastern White Pine

A 9. Which of the following is a deciduous conifer?

A. Common Baldcypress
B. Norway Spruce
C. Douglasfir
D. Eastern White Pine

D 10. Which of the following has a mature size of 20' x 20'?

A. European Larch
B. Balsam Fir
C. Andorra Creeping Juniper
D. Pfitzer Chinese Juniper

UNIT F: PLANT IDENTIFICATION

PROBLEM AREA: IDENTIFYING VINES AND GROUND COVERS IN THE LANDSCAPE

SUGGESTIONS TO THE TEACHER:

This problem area is designed for use with tenth-grade or second-year students in a horticultural or agricultural occupations program. The recommended time for teaching this problem area is during the fall semester.

The estimated instructional time for this problem area is 2 to 5 days, depending on how far the teacher wishes to go in developing identification and selection skills at the second-year level. If the teaching plan is limited to classroom discussion with little or no practice or observation, the instruction can be 2 days or less. If the students are to be involved in other activity exercises, the instruction time will need to be increased.

Instructors are encouraged to conduct a local search to locate other supplementary materials for use with this problem area. The items in this problem area are for reference or modification as instructors adapt this problem area to their local situation.

CREDIT SOURCES:

These materials were developed through a funding agreement, R-33-32-D-0542-388 with the Illinois State Board of Education, Department of Adult, Vocational and Technical Education, Research and Development Section, 100 North First Street, Springfield, Illinois 62777. Opinions expressed in these materials do not reflect, nor should they be construed as policy or opinion of the Illinois State Board of Education or its staff.

The teacher's guide, student worksheet, and test questions were developed by Jim Ethridge, Joliet Junior College and Ron Biondo, Department of Vocational and Technical Education, University of Illinois. Transparency masters and the transparency discussion guide were prepared by Vocational Agriculture Service, University of Illinois. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Field Test Teachers.

TEACHERS' GUIDE

I. Unit: Plant identification

II. Problem area: Identifying vines and ground covers in the landscape

III. Objectives: At the close of this problem area, the student will be able to:

1. Identify by their common name 5 local vines and 10 ground covers used in residential areas.

2. Select vines and ground covers for various environmental conditions.

3. Identify the vegetative and floral characteristics used to recognize vine and ground cover plant species.

IV. Suggested interest approaches:

1. Have a local nursery operator or landscaper visit the class and have them identify the common vines and ground covers used in landscaping in your area. Emphasis should be on the most common plant materials.

2. Ask the student to name vines and ground covers they have growing in their home landscape. Have the students bring in sample specimens of those plants and identify these plants in class.

3. Have a scavenger hunt. (See problem area "Identifying and Using Trees and Shrubs in the Landscape" for details.)

V. Anticipated problems and concerns of students:

1. What is meant by the term "ground cover?"

2. When is ground cover also a vine?

3. When is a ground cover also a low-growing shrub?

4. What are the different uses of ground covers?

5. What consideration should be determined before selecting a ground cover?

6. Where does a person use vines in the landscape?

7. What vines also flower?

8. What support structures area needed for growing a vine?

9. How do you care for vines in the landscape?

10. When are ground covers not appropriate in the landscape?

11. When is turf preferred over another ground cover?

12. What are the ten most common ground covers?

13. What are the ten most common vines used in landscaping?

VI. Suggested learning activities and experiences:

1. Discuss the terminology used when identifying different types of vines.

2. Discuss the terminology used when identifying different types of ground covers.

3. Show slides on ground covers and vines and describe the specific characteristics of each.

4. Have the students complete the worksheets.

5. Have the class collect vine and ground cover specimans for identification and discuss their culture and care.

6. Take a walk in the neighborhood and identify vines and ground covers.

7. Have the students collect and correctly identify leaves and stems from 5 different vines.

8. Have the students collect and correctly identify leaves and stems from 5 different ground covers.

9. Take a field trip to an arboretum or garden center and review plant materials commonly used and sold in your area.

10. Split the class or group into teams and have them compete in a plant materials scavenger hunt.

11. Develop the school landscape by obtaining plant materials discussed in class and then planting them in the school landscape. These plant materials will serve as your land laboratory and propagation mother block.

12. Have the students record a vine and ground cover fall color list.

13. Participate in the local, regional and State FFA and National Junior Horticulture Judging Contests.

14. Have the students make a list of all the vines and ground covers plants grown at their home.

15. Discuss how plant identification can be the subject for a supervised occupational experience program.

16. Have each student keep a plant display on a specific vine or ground cover.

VII. Application procedures:

1. Identification skills should be put to use when selecting vines and ground covers.

2. Identification skills learned will aid students working at garden centers, nurseries, parks, arboretums, florists, landscaping firms, etc.

3. Plants must be correctly identified in order to meet the proper cultural requirements of the plants and to fit them into the landscape situation.

IX. Evaluation:

1. Collect and evaluate student worksheets

2. Prepare and administer an objective pencil and paper test using Sample Test Questions and laboratory specimens.

3. Administer quizzes upon the completion of each I.D. Section (i.e., vines and ground covers). Split the class into teams and record scores for both individual and team performance.

X. References and aids:

1. Manual of Woody Landscape Plants, M. A. Dirr, Stipes Publishing Company, Champaign, Illinois. Copyright, 1975.

2. University of Illinois, College of Agriculture, Vocational Agriculture Service:

VAS Slide Set #646 "Ground Covers and their Uses"

STUDENT WORKSHEET

IDENTIFYING VINES AND GROUND COVERS

I. Introduction:

The purposes of this exercise is to provide a means of recording information about vines and ground covers.

II. Objective:

Upon completion of this exercise, students will be able to identify by name and describe selected ground covers and vines.

III. Procedure:

When observing a vine or ground cover, record the identification features along with the common name on the form provided.

Observe cultural considerations as well as cultural care of the plant.

IV. Suggested ground covers and vines for identification:

Ground Covers	Vines
1. Barren-strawberry	1. Arebia, Fiveleaf
2. Bugle, Carpet	2. Clematis, Jackman
3. Candytuft, Evergreen	3. Grape
4. Cotoneaster, Rockspray	4. Ivy, Boston
5. Daylily	5. Morning-glory
6. Euonymus, Wintercreeper	6. Trumpetcreeper
7. Forsythia, Bronx	7. Virginia Creeper
8. Goutweed	8. Wisteria, Japanese
9. Hosta	
10. Ivy, English	
11. Juniper, Creeping	
12. Lily-of-the-valley	
13. Periwinkle, Common	
14. Phlox, Creeping	
15. Sedum, Dragon's Blood	
16. Spurge, Japanese	
17. Violets	

STUDENT WORKSHEET (CON'T)

IDENTIFYING VINES AND GROUND COVERS

Plant Name	Leaf Characteristics	Growth Rate	Size	Fruit or Cone	Additional Notes

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

IDENTIFYING VINES AND GROUND COVERS IN THE LANDSCAPE

Fill in the blanks:

1. Morning-glory is an annual vine that is used for quick cover, and the flowers are white, blue, or pink.

2. Lily-of-the-valley is a herbaceous ground cover with white bell-shaped flowers.

3. Creeping Phlox is a herbaceous perennial that is creeping. The flowers may be lavender, white or rose.

4. Japanese Spurge is a herbaceous evergreen ground cover which develops pale yellow leaves when planted in full sun.

5. Barren-strawberry is a herbaceous evergreen about 6" tall which is a carpet of yellow flowers in the spring.

6. Rockspray Cotoneaster is a woody fine-textured plant with glossy dark green leaves and red fruit.

7. Trumpetcreeper is a weedy vine which displays bright orange flowers in July and August.

8. Boston Ivy is a woody vine with simple leaves and it is commonly used on the sides of buildings.

9. Daylilies got their name because each flower lasts only one day.

10. Bronx Forsythia is a woody ground cover which can be 2' x 4' and displays small but abundant yellow flowers.

Multiple Choice

B 1. Which of the following plants is a vine?

A. Evergreen Candytuft
B. Fiveleaf Akebia
C. Rockspray Cotoneaster
D. Sedum

A 2. Some _____ species have red flowers.

A. Sedum
B. Goutweed
C. Carpet Bugle
D. Creeping Juniper

B 3. Which vine prefers alkaline soil and has blue, red or purple flowers in summer and fall?

A. Trumpetcreeper
B. Jackman Clematis
C. Virginia Creeper
D. Japanese Wisteria

D 4. Which of the following displays a prominant flower?

A. Goutweed
B. Japanese Spurge
C. English Ivy
D. Daylilies

B 5. Which of the following can become a lawn weed?

A. Bronx Forsythia
B. Violets
C. Wintercreeper Euonymus
D. Goutweed

B. 6. Which of the following displays bluish flowers?

A. Lily-of-the-valley
B. Common Periwinkle
C. Rockspray Cotoneaster
D. Virginia Creeper

C 7. Which of the following has floral inflorescences up to 2 feet long?

A. Carpet Bugle
B. Violets
C. Japanese Wisteria
D. Barren-strawberry

D 8. Which of the following is a semievergreen with abundant white flowers?

A. Jackman Clematis
B. Bronx Forsythia
C. Trumpetcreeper
D. Evergreen Candytuft

C 9. Which of the following has edible fruit?

A. Morning-glory
B. Fiveleaf Akebia
C. Grape
D. Daylily

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A 10. Which of the following is a spreading woody evergreen with scale-like leaves.

A. Creeping Juniper
B. Wintercreeper Euonymus
C. Japanese Spurge
D. English Ivy

UNIT F: PLANT IDENTIFICATION

PROBLEM AREA: IDENTIFYING AND USING ANNUAL AND PERENNIAL FLOWERS IN THE LANDSCAPE

SUGGESTIONS TO THE TEACHER:

This instructional packet is designed for use with tenth-grade or second-year students in a horticultural or agricultural occupations program. The recommended time for teaching this problem area is during the spring semester.

The estimated instructional time for this problem area is 5 to 15 days, depending on how far the teacher wishes to go in developing identification skills at the second-year level. If the teaching plan is limited to classroom discussion with little or no practice or observation, the instruction can be 5 days or less. If the students are to be involved in activity exercises, the instructional time will need to be increased.

The instructor is encouraged to conduct a local search to locate other supplementary materials for use with this problem area. The items in this problem area are for reference or modification as instructors adapt this problem area to their local situation.

CREDIT SOURCES:

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The teacher's guide, student worksheet, and test questions were developed by Jim Ethridge, Joliet Junior College, and Ron Biondo, Department of Vocational and Technical Education, University of Illinois. Transparency masters and the transparency discussion guide were prepared by Vocational Agriculture Service, University of Illinois. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Pilot Test Teachers.

TEACHER'S GUIDE

I. Unit: Plant identification

II. Problem area: Identifying and using annual and perennial flowers in the landscape

III. Objectives: At the close of this problem area, the student will be able to:

1. Identify local annual and perennial flowers used in residential areas by their common name.

2. Select annuals and perennial flowers for various environmental conditions.

3. Identify the vegetative and floral characteristics used to recognize annual and perennial flower plant species.

IV. Suggested interest approaches:

1. Ask the student to name the annual and perennial flowers they have growing in their home landscape. Have them bring in specimens of those plants and identify those plants in class.

2. Take an early spring walk or late fall walk and observe the condition of annuals and perennials in the landscape. Point out such plants that do very well in the cool fall weather and the plants that emerge from the soil early in the spring. Also point out those plants that get or receive frost heaving from not being properly mulched or those that have a very shallow root system.

3. Visit a botanical garden and observe the annuals and perennials.

V. Anticipated problems and concerns of students:

1. What is an annual flower?

2. What is a perennial flower?

3. Can the same flower be an annual in one location and a perennial in another location?

4. What is a biennial? Can this plant be an annual or perennial in other locations?

5. Are bulbs, corms, and tubers annual or biennials if they must be dug in order to over winter cold conditions?

6. What are the major consideration in selecting an annual flower to plant?

7. When should one consider planting a perennial garden over planting an annual garden?

8. Should annual flowers and perennial flowers to be planted together?

9. How does one plant an annual or perennial flower garden?

10. What is the difference between a border planting and a garden?

11. What plants grow well in a sunny location? in a shady location?

12. What flowers grow well in a moist condition? in a dry condition?

13. What flowers grow well in cool temperatures and what plants grow well in warm temperatures?

14. How do I plant a bulb garden? annual garden? perennial garden?

15. What annuals and perennials are grown for their foliage?

16. What flowers have a spike-type inflorecence?

17. What annuals and perennials grow well in a shady location? in a wet location?

18. What annuals and perennials will grow in an acid location? in an alkaline location?

19. What is the difference among the daisies, asters, and chrysanthemums?

20. What house plants are also grown in the annual flower garden?

21. What are the different types of daffodils? tulips? iris? peonies?

22. What are the different types of roses? lilies? and begonias?

VI. Suggested learning activities and experiences:

1. Begin from seed several of the common annual flowers and develop a production schedule for each flower. By keeping production records on the crops, the students will be able to determine how successful they were in the production of the crop.

2. During the first year of horticulture the students can begin a perennial flower crop and keep records on the crop the second year. Many of the perennials will take two growing seasons to come into flower from seed. This would demonstrate the long-term investment of growing a perennial flower over growing a production crop such as mums or poinsettias.

3. Purchase field grown stock for planting during the spring semester from a wholesale operation and force the perennial flowers into flower for spring planting or sale.

4. Have a local annual flower grower, bedding plant grower, or home owner who grows and maintains an annual garden or perennial border to visit the class and have them identify the common annual and perennial flowers they encounter in their profession.

5. Discuss the terminology used when identifying flowers.

6. Have the students complete the Student Worksheet on Flower Terminology.

7. Show slides on flower identification by their growth habit and flower.

8. Take a walk in the neighborhood and identify flowers.

9. Have the students collect and correctly identify 10 annual flowers.

10. Have the students collect and correctly identify 10 perennial flowers.

11. Have the students collect and correctly identify 5 biennial flowers.

12. Show slides on the identification of flowers. Discuss the characteristics of a selected group of plants they are likely to become familiar with while working in a garden center.

13. Take a summer field trip to a local perennial garden and review annual and perennial flowers commonly grown in the area.

14. Split the class into teams and have them compete in a plant materials scavenger hunt.

15. Develop the school landscape by obtaining and installing plant materials discussed in class. These plant materials will serve as an important part of the land laboratory, and they will help beautify the school grounds.

16. Have the students grow selected annual and perennial flowers as a production project in the school greenhouse or in the school land laboratory.

VII. Application procedures:

1. Identification skills should be put to use when selecting flowering and foliage annuals and perennials for the home landscape.

2. Identification skills learned will aid students working at garden centers, nurseries, parks, arboretums and retail florists.

3. Plants must be correctly identified and selected in order to meet the proper cultural requirements of the plants and to fit into the home owner's situation.

IX. Evaluation:

1. Collect and evaluate Student Worksheets.

2. Prepare and administer an objective pencil and paper test using Sample Test Questions and laboratory specimens.

X. References and aids:

1. University of Illinois, College of Agriculture, Vocational Agriculture Service:

   VAS Unit #5010a "Growing Annual Flowers"

   VAS Slide Set #601a "Garden Flowers, Annuals"
   602a "Garden Flowers, Annuals"
   604 "Garden Flowers, Perennials"
   605 "Garden Flowers, Perennials"
   606 "Garden Flowers, Perennials"

2. Brooklyn Botanic Garden Record Plants and Gardens:

   a. "A Handbook on Annuals," Vol. 30 No. 2.
   b. "Bulbs," Vol. 31.

3. Illinois Cooperative Extension Service:

   a. Horticultural Facts, FL-2-79 "Flowering Annuals and Bedding Plants" publications films, and slide sets.

4. Information Sheets included with this problem area:

   a. Partial Listing of Major Seed Companies
   b. Garden Flowers: Partial List of Catalogs
   c. Suggested Annual and Perennial Flowers for Identification
   d. Perennials
   e. Partial List of Annuals and Perennials For Use in Shade
   f. Partial Listing of Gardens in and Around Illinois

5. Student Worksheet on Flower Terminology

6. Sample Test Questions and Teacher's Key

INFORMATION SHEET

PARTIAL LISTING OF MAJOR SEED COMPANIES

Wholesale Seed Companies (W)

GEO. J. BALL, INC., Box 335, West Chicago, Illinois 60185

BALL-SUPERIOR, LTD., (subsidiary of Geo. J. Ball, Inc.), 1155 Birchview Drive, Mississauga, Ontario, Canada

W. ATLEE BURPEE CO., Court House Square, Clinton, Iowa 52732 (Also Pa. & Calif.)

FERRY-MORSE SEED CO., INC., P. O. Box 8, San Juan Bautista, California 95045

H. G. GERMAN SEEDS, Box N, 130 Bank St., Smethport, Pennsylvania 16749

GERMANIA SEED CO., 5952 N. Milwaukee Ave., Chicago, Illinois 60646

FRED C. GLOECKNER & CO., INC., 15 E. 26th St., New York, New York 10010

JOSEPH HARRIS CO., INC., Moreton Farm, 3670 Buffalo Rd., Rochester, New York 14624

HERBST BROS. SEEDSMEN, INC., 1000 N. Main St., Brewster, New York 10509

A. H. HUMMERT SEED CO., 2746 Chouteau Ave., St. Louis, Missouri 63103

HENRY F. MICHELL CO., Church Rd., King of Prussia, Pennsylvania 19406

NORTHRUP-KING & CO., 1500 Jackson St., N.E., Minneapolis, Minnesota 55413

PARK SEED WHOLESALE, INC., Cokesbury Rd., Greenwood, South Carolina 29646

STOKES SEEDS, INC., Box 548, Buffalo, New York 14240 (home office in Canada)

VAUGHAN-JACKLIN CORP., 5300 Katrine Ave., Downers Grove, Illinois 60515

Retail Seed Companies (R)

BURGESS SEED & PLANT CO. (subsidiary of Geo. J. Ball, Inc.), Galesburg, Michigan 49053

BURNETT BROS., INC., 92 Chambers St., New York, New York 10007

W. ATLEE BURPEE CO. (see W)

FARMER SEED & NURSERY CO., Faribault, Minnesota 55021

HENRY FIELD SEED & NURSERY CO., Shenandoah, Iowa 51601

GURNEY SEED & NURSERY CO., Yankton, South Dakota 57078

JOSEPH HARRIS CO., INC. (see W)

JACKSON & PERKINS CO., 200 Rose Lane, Medford, Oregon 97501

J. W. JUNG SEED CO., Randolph, Wisconsin 53936

EARL E. MAY SEED & NURSERY CO., Shenandoah, Iowa 51601

L. L. OLDS SEED CO., Box 1069, Madison, Wisconsin 53701

GEO. W. PARK SEED CO., INC., Cokesbury Rd., Greenwood, South Carolina 29646 (see W)

SEEDWAY, INC., Hall, New York 14463

R. H. SHUMWAY, SEEDSMAN, 628 Cedar St., Rockford, Illinois 61101

STOKES SEED, INC., (see W)

THOMPSON & MORGAN, LTD., P. O. Box 24, Somerdale, New Jersey 08083

INFORMATION SHEET

GARDEN FLOWERS:
PARTIAL LIST OF CATALOGS

Name	Specialty
Burpee Seeds Warminester, PA 18974	General line perennials (seeds only)
Conrad-Pyle Co. West Grove, PA 19390	Chrysanthemums and roses
De Jager and Sons, Inc. South Hamilton, MA 01982	Bulbs, iris and lilies
Dutch Gardens P.O. Box 30 Lisse, HOLLAND	Spring flowering bulbs (very good)
Interstate Nursery Hamburg, IA 51649	Roses, lilies, iris and general line perennials
Lamb Nurseries E. 101 Sharp Avenue Spokane, WA 99202	General line perennials
Lehman Gardens Faribault, MN 55021	Chrysanthemums
McCormick Lilies P. O. Box 700 Canby, OR 97013	Lilies
Messelaar Bulb Co., Inc. County Road Route 1-A, Box 269 Ipswich, MA 01913	Fall and spring flowering bulbs
Grant E. Mitsch Canby, OR 97013	Daffodils
Oregon Bulb Farms Gresham, OR 97030	Lilies
Park Seed Co., Inc. Greenwood, SC 29647	General line perennials (seeds only)
Rex Bulb Farms Newberg, OR 97132	Lilies
Scheepers, Inc. 63 Wall Street New York, NY 10005	Bulbs, chrysanthemums and general line perennials

Name	Specialty
Schreiner's 3625 Quinaby Road, N.E. Salem, OR 97303	Iris
Smirnow Gardens 85 Linden Lane Glen Head P.O., Brookville Long Island, NY 11545	Tree peonies
Sunnyslope Gardens 8638 Huntington Drive San Gabriel, CA 91775	Chrysanthemums
Thon's 4815 Oak Street Crystal Lake, IL 60014	Chrysanthemums
Van Bourgondien's 245 Farmingdale Road Route 109, Box A Babylon, New York 11702	Bulbs and general line perennials
Walter Marx Gardens Boring, OR 97009	Iris, day lilies
Walter's Gardens, Inc. P.O. Box 137-96th Ave., M-21 Zeeland, MI 49464	General line perennials
Wayside Gardens Hodges, SC 29695	Bulbs, lilies, iris, peonies and general line perennials
Weller Co. P. O. Box 1111 Holland, MI 49423	General line perennials
White Flower Farm Litchfield, CT 06759	General line perennials (very good)
Wild and Sons, Inc. Sarcoxie, MO 64862	Peonies, iris, day lilies
Yoder Brothers, Inc. Barberton, OH 44203	Chrysthanemums

INFORMATION SHEET

SUGGESTED ANNUALS AND PERENNIAL FLOWERS FOR IDENTIFICATION

Annual Flowers	Perennial Flowers
1. Ageratum	1. Yarrow
2. Snapdragon	2. Columbine
3. Wax Begonia	3. Butterfly Milkweed
4. Celosia	4. Astilbe
5. Bachelor Button	5. Campanula
6. Coleus	6. Pyrethum Daisy
7. Cosmos	7. Shasta Daisy
8. Dahlia	8. Hardy Chrysanthemum
9. Annual Carnation	9. Coreopsis
10. Fuchsia	10. Delphinium
11. Sunflower	11. Bleeding Heart
12. Balsam	12. Foxglove
13. Impatiens	13. Globe Thistle
14. Lantana	14. Gaillardia
15. Lobelia	15. Geranium
16. Sweet Alyssum	16. Day Lily
17. Four-o'clock	17. Coral Bells
18. Geranium	18. Red Hot Poker
19. Petunia	19. Sweetpea
20. Moss Rose	20. Liatris Gay Feather
21. Blue Salvia	21. Lupine
22. Red Salvia	22. Evening Primrose
23. Marigold	23. Iris
24. Nasturtium	24. Peony
25. Pansy	25. Hollyhock
26. Verbena	26. Aster
27. Vinca	27. Poppy
28. Zinnia	28. Rudbeckia
	29. Sedum

INFORMATION SHEET

PERENNIALS

Perennials are hardy plants which will live and bloom every year for a long period, and once established require less care than annuals. Perennials begin blooming the second year from seed.

No group of plants will better reward the time spent in preparing for planting than the perennials. Most perennials are deeper rooted than the annuals (such things as iris and phlox would be an exception) and, of course, will remain in the same location for many years. However, they do not have the very extensive root system of trees and shrubs which can draw nourishment from a wide area. Thus, the perennial bed should be especially enriched--worked as deeply as possible before it is planted, with well-rotted or dehydrated cow manure, leaf mold, etc. worked down. The full depth of a spading fork is minimum.

Soil in good condition is easily recognized. It is easy to work in. It can be dug without effort and without forming large clods. Water does not stand on it after a rain. The soil can be worked, cultivated and walked on the next day after a moderate rain. It does not crack or bake hard, even if not scratched up after a hard rain. If sandy, it is in good tilth, if most plants do not wilt when they are without rain or watering for a week.

Problem soils should be corrected by improving aeration and drainage with the addition of sharp sand. They should be corrected by improving organic matter content through the incorporation of manure, peat moss, leaf mold, or other compost. Any soil reaction below pH 5.5 must be corrected by the addition of lime. A pH of 6.2 to 7.0 is optimum.

INFORMATION SHEET

PARTIAL LIST OF
ANNUALS AND PERENNIALS FOR USE IN SHADE

ANNUALS FOR LIGHT SHADE, OR PARTIAL SHADE
(5-8 hours of sun per day), but all perform better in full-sun locations)

Celosia (C. plumosa & cristata types)
China Aster (Callistephus)
China Pink (Dianthus)
Cleome
Cornflower (Centaurea)
Cosmos (C. bipinnatus & sulphereus)
Cynoglossum
Dusty Miller
Feverfew (Matricaria)
Flowering Tobacco (Nicotiana)
Four O'Clock (Mirabilis)
Foxglove (Digitalis)
Geranium (Pelargonium) (non-seed types)
Gloriosa Daisy (Rudbeckia)
Madagascar Periwinkle (Vinca rosea)
Nasturtium (Tropaeolum)
Nierembergia
Penstemon
Petunia
Phlox (Annual)
Polka Dot Plant (Hypoestes)
Salpiglossis
Salvia, Red (S. splendens)
Salvia, Blue (S. farinacea)
Sanvitalia
Snapdragon (Antirrhinum)
Sweet Alyssum (Lobularia)

ANNUALS FOR LIGHT TO MODERATE SHADE
(but generally not recommended for full-sun locations in Illinois)

Basket Asparagus (A. sprengeri)
Browallia
Calceolaris (Rugosa type)
Coleus (seed type)
Exacum
Fancy-leaved Caladium
Fuchsia
Impatiens (I. wallerana)
Lobelia
Mimulus
Pansy
Torenia
Tuberous-rooted Begonia
Wax Begonia

PERENNIALS FOR LIGHT TO MODERATE SHADE

Anchusa Myosotidiflora
Anemone Japonica
Aquilegia
Arenaria Verna Caepitosa
Campunala Carpatica
Dicentra Bountiful
Doronicum
Eupatorium
Geranium
Hemerocallis

ANNUALS FOR LIGHT SHADE, OR PARTIAL SHADE

Thunbergia
Verbena
Ageratum
Balsam (Impatiens balsamina)
Calendula
Calliopsis
Candytuft

PERENNIALS FOR LIGHT TO MODERATE SHADE

Heuchera
Iberis
Iris Pumila
Monarda
Oneothera
Pachistima Canbyi
Plumbago
Thalictrum
Tradescantia
Trollius
Viola

INFORMATION SHEET

PARTIAL LISTING OF GARDENS IN AND AROUND ILLINOIS

All-America Trial Gardens:

University of Illinois, Department of Horticulture, Florida & Lincoln Aves., Urbana, IL

Geo. J. Ball, Inc., West Chicago, IL

Vaughan-Jacklin Corp., Downers Grove (planting is on the grounds of Kishwaukee College, Malta, IL)

Boerner Botanical Garden - Superb perennial gardens, roses, rock and herb gardens, floral displays, test areas, bog garden, trails. A unit of Milwaukee Co. Park System, open daily. Address: Whitnall Park, Hales Corners, Wis. 53130 (Rte. 100 s.w. of Milwaukee). Phone: 414-425-1130.

Chicago Botanic Gardens - Arboretum (new), gardens, conservatory. Operated by Chicago Horticultural Soc. Admission charged. Open daily. Address: Glencoe, IL 60022 (take I-94 n. to Lake Cook Rd., then east). Phone: 312-835-5360.

Cranbrook House and Garden - 40 acres of English gardens, roses, annuals, wild flowers, bulbs, maintained by volunteer organization. Admission charged. Open afternoons from Memorial Day through Labor Day. Address: 380 Lone Pine Rd., Bloomfield Hills, Mich. 48013.

The Dawes Arboretum - 500 acres, trees, shrubs, Japanese garden, bonsai collection, crabapples. Privately operated. Open 8-4:30 Monday through Friday; opens at 9 on Saturdays and 1 p.m. Sundays. Address: 7770 Jacksontown Rd. S.E., Newark, Ohio 43055 (Rte. 13 6 mi. s. of Newark). Phone: 614-323-2355.

Fernwood - Natural study area, 3/8 mile along St. Joseph River, gardens, trails, horticulture and art center. Privately operated. Admission charged. Open daily 9-4:30, weekends 10-5. Address: 1720 Range Line Rd., Niles, Mich. 49120 (8 mi. n. of Niles on Rte. 31). Phone: 616-695-6491.

Garfield Park Conservatory - Palm house, aroid house, cactus house, Japanese tea garden, special shows all year, outstanding. Operated by city, no charge. Open daily. Address: 300 N. Central Pk. Blvd., Chicago, Ill. 60624. Phone: 312-533-1281.

Lincoln Park Conservatory - On Lake Michigan, tropical house, fernery, palm house, orchids, outdoor gardens, changing floral exhibits. Operated by city, no charge. Open daily. Address: 2400 N. Stockton Dr., Chicago, Ill. 60614. Phone: 312-294-4770.

McCormick Gardens, "Cantigny," Winfield, IL

Missouri Botanical Garden, 2345 Tower Group Ave., St. Louis, MO 63110. Phone: 314-772-7600.

Mitchell Park Conservatory - Three glass domes each devoted to different set of plants - show house, topical house, semi-arid house. Operated by Milwaukee County. Admission charged. Open daily. Address: 524 S. Layton Blvd., Milwaukee, Wis. 53215 (downtown). Phone: 414-278-4384.

Morton Arboretum - 1,500 acres of trees, shrubs, hedges, ground covers, trails, library. Privately operated. Admission charged. Grounds open daily 8 a.m. to dusk. Building closed holidays and Sundays in winter. Address: Rte. 53, Lisle, Ill. 60532 (from Chicago take East-West Tollway w. to jct. with Rte. 53).

STUDENT WORKSHEET

GARDEN FLOWER TERMINOLOGY

Matching

1.	_____Annual	A.	Soft, not woody stems
2.	_____Basal	B.	Female flower part
3.	_____Biennial	C.	Three or more seasons in the life cycle
4.	_____Bulb	D.	A modified underground stem
5.	_____Perennial	E.	One unit of a flower, usually colorful
6.	_____Petal	F.	Living and maturing in one season
7.	_____Pistil	G.	Outer unit of a flower, usually green
8.	_____Pollen	H.	Male part of flower
9.	_____Sepal	I.	As in leaves attached at the base of the plant
10.	_____Stamen	J.	Microspores borne on the stamen
11.	_____Inflorescence	K.	Life cycle consisting of two years
12.	_____Herbaceous	L.	Arrangement of flowers on an axis

TEACHER'S KEY TO STUDENT WORKSHEET

GARDEN FLOWER TERMINOLOGY

Matching

1.	F Annual	A.	Soft, not woody stems
2.	I Basal	B	Female flower part
3.	K Biennial	C.	Three or more seasons in the life cycle
4.	D Bulb	D.	A modified underground stem
5.	C Perennial	E.	One unit of a flower, usually colorful
6.	E Petal	F.	Living and maturing in one season
7.	B Pistil	G.	Outer unit of a flower, usually green
8.	J Pollen	H.	Male part of flower
9.	G Sepal	I.	As in leaves attached at the base of the plant
10.	H Stamen	J.	Microspores borne on the stamen
11.	L Inflorescence	K.	Life cycle consisting of two years
12.	A Herbaceous	L.	Arrangement of flowers on an axis

SAMPLE TEST QUESTIONS WITH TEACHERS KEY

IDENTIFYING ANNUALS AND PERENNIALS IN THE HOME LANDSCAPE

Multiple Choice

B 1. Which of the following annuals has white flowers?

A. Sunflower
B. Begonia
C. Salvia
D. Rudbeckia

A 2. Which of the following annuals has red flowers?

A. Petunia
B. Marigold
C. Sweet Alyssum
D. Ageratum

A 3. Which of the following annuals has blue flowers?

A. Ageratum
B. Begonia
C. Four-o'clock
D. Moss Rose

B 4. Which of the following annuals grows over three feet tall?

A. Verbena
B. Cleome
C. Dianthus
D. Coleus

A 5. Which of the flowering annuals is grown for its fragrance?

A. Annual carnation
B. Aster
C. Coleus
D. Petunia

C 6. Which of the following annuals is suited for hanging baskets?

A. Zinnia
B. Sunflower
C. Petunia
D. Cleome

D 7. Which of the following is a vine?

A. Nasturtium
B. Geranium
C. Zinnia
D. Sweetpea

C 8. Which of the following annuals is grown for its unusual foliage or fruit?

A. Snapdragon
B. Fuchsia
C. Kochia
D. Begonia

A 9. Which flower will tolerate full sun, dry location?

A. Moss Rose
B. Wax Begonia
C. Impatiens
D. Sweet Alyssum

C 10. Which of the following perennials has red flowers?

A. Hosta
B. Iris
C. Red-Hot-Poker
D. Foxglove

C 11. Which of the following perennials has red flowers?

A. Coreopsis
B. Delphinium
C. Day Lily
D. Shasta Daisy

B 12. Which perennial grows over 3 feet tall?

A. Sedum
B. Canna
C. Bleeding Heart
D. Crocus

D 13. Which of the following perennials grows over 3 feet tall?

A. Fern leaf yarrow
B. Asters
C. Astilbe
D. Hollyhock

C 14. Which of the following is the shortest perennial?

A. Lupine
B. Columbine
C. Sedum - Dragon's Blood
D. Red-Hot-Poker

C 15. Which perennial has orange flowers?

A. Allium
B. Delphinium
C. Canna
D. Iris

A 16. Which of the following perennials is grown primarily for its foliage?

A. Hosta
B. Lupine
C. Aster
D. Peony

D 17. Which of the following has small flowers?

A. Celosia
B. Bachelor Buttons
C. Fuchsia
D. Sweet Alyssum

C 18. Which of the following has sword-like foliage?

A. Bleeding Heart
B. Campanula
C. Iris
D. Columbine

A 19. Which of the following flowers in late summer or fall?

A. Hardy Chrysanthemum
B. Peony
C. Hollyhock
D. Aster

D 20. Which of the following have flowers on a spike?

A. Lobelia
B. Geranium
C. Pansy
D. Snapdragons

UNIT F: PLANT IDENTIFICATION

PROBLEM AREA: IDENTIFYING AND CARING FOR FLOWERING AND FOLIAGE HOUSE PLANTS

SUGGESTIONS TO THE TEACHER:

This problem area should be taught to tenth-grade or second-year students enrolled in horticultural occupations or agricultural occupations programs. The recommended time for teaching this problem area is during the fall and spring semesters. It is important that students have a sound background in plant terminology before they begin identifying plants available to the horticulturalist. The estimated instructional time for this problem area is 4-12 days depending on how far the instructor wishes to go in developing identification and care skills at the advanced-students level. If the teaching plan is limited to classroom discussion with little or no practice, the instructional time can be limited to 4 days or less. If the students are to be involved in outside activities the instructional time will need to be increased.

The instructor is encouraged to conduct a local search to locate other supplementary materials for use with this problem area. The items in this problem area are for reference and modification as instructors adapt these materials to their local situation.

To maintain student interest in this problem area, split the class into teams and record team and individual quiz scores. Award the best team and individual scorers by letting them compete in regional competition.

CREDIT SOURCES:

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The teacher's guide, information sheet, student worksheets, and test questions were developed by Ron Biondo, Department of Vocational and Technical Education, University of Illinois and Jim Ethridge, Joliet Junior College. Transparency masters, and the transparency discussion guide were prepared by Vocational Agriculture Service, University of Illinois. The information sheet "Foliage Plant Care Code" was adapted from Exotic House Plants, A. B. Graf. Suggestions and guidance in the development of these materials were provided by the Metropolitan Core Curriculum Field Test Teachers.

TEACHER'S GUIDE

I. Unit: Plant identification

II. Problem area: Identifying flowering and foliage house plants

III. Objectives: At the close of this problem area the student will:

1. Identify 50 flowering and foliage plants in the home by their common name.

2. Select flowering and foliage plants used in the home area for various environmental conditions.

3. Identify the vegetative and floral characteristics used to recognize flowering and foliage house plants.

IV. Suggested interest approaches:

1. Have a local florist or greenhouse grower visit the class and identify the common foliage and flowering house plants they encounter in their profession. Emphasis should be on the most common plant materials.

2. Ask the students to name foliage and flowering house plants in their home. Have them bring in specimens of those plants and identify them in class.

3. Present the question, "Why is it important to be able to identify foliage and flower house plants correctly?

4. Pull from the plant collection that is maintained at the school greenhouse a collection of plants for identification. Note that the same methods of identifying outdoor plants are used in the identification of indoor plants. Show instances where some outdoor plants are grown as indoor plants in your area.

V. Anticipated problems and concerns of students:

1. How do I determine how much light my plant needs?

2. How do I determine how much light is available in the location in which I want to place a plant?

3. At what temperature does my plant thrive?

4. How often should I water my plant?

5. What effect does softened water have on plants?

6. How often should my plant flower in the home?

7. How do I care for hanging basket plants in the home?

8. How do I get my plant to re-bloom in the home?

9. Do all house plants grow under the same conditions?

10. How do I build a terrarium?

11. How do I care for a terrarium?

12. Are all terrariums cared for in the same manner?

13. What do I do with a house plant that has overgrown the space for which it was intended?

14. What house plants are commonly grown for their foliage?

15. What house plants are commonly grown for their flowers?

16. What type of soil does my house plant need?

17. How often should I transplant my house plant?

VI. Suggested learning activities and experiences:

1. Discuss the terminology used when identifying foliage and flowering house plants.

2. Have the students complete the worksheets.

3. Show slides on foliage and flowering house plants and describe specific characteristics of each species.

4. Take a walk through a local greenhouse or florist shop or conservatory and identify foliage and flowering house plants commonly found in the home. This can also be done as a review.

5. Have the students collect and correctly identify leaves of 20 foliage house plants.

6. Have the students collect and correctly identify leaves and flowers of 20 flowering house plants.

7. Show slides of hanging baskets, flowering house plants, plants used on and off furniture in the home setting. Discuss the characteristics of these selected house plants and how they might fit into the interior landscape of the home.

8. Split the class into teams and have them compete in a plant materials scavenger hunt.

9. Develop the school greenhouse by obtaining the plant materials discussed in class. Maintain these plants in the school greenhouse or "loan" them out to school offices and determine which plants thrive best in given locations. An excellent on-the-job training experience would be for students to maintain the "on loan" plants under an agreement similar to the agreements that plant rental companies have.

10. Have each student maintain a plant diary on his/her own plant. Student plants may be kept in the greenhouse or classroom.

11. Have each student construct a terrarium in class. Be sure that only appropriate plant materials are used.

12. Have students collect tips from magazine articles about the care of house plants. When discussing a particular house plant, have the student share their information with the class and have the student lead the discussion as to how to identify and care for that particular plant.

13. Set up a hall display of five common house plants each week for other teachers and students to observe. Have the students groom the plants for the display and have the students write a paragraph on how to care for this plant and under what conditions to grow this plant in the home.

VII. Application procedures:

1. Identification skills should be put to use when selecting flowering and foliage house plants.

2. Identification skills learned will aid students working at garden centers, nurseries, parks, arboretums and florists.

3. Plants must be correctly identified in order to determine the proper cultural requirements and to fit plants into the home owner's situation.

IX. Evaluation:

1. Collect and evaluate student worksheets

2. Prepare and administer an objective pencil and paper test using Sample Test Questions and laboratory specimens.

3. Administer quizzes upon the completion of each I.D. Section (i.e. flowering and foliage house plants). Split the class into teams and record scores for both individual and team performance.

4. Grade the terrariums constructed in class. Some criteria might include: appropriateness of plant material, scale, neatness, and design.

X. References and aids

1. University of Illinois, College of Agriculture, Vocational Agriculture Service.

   a. Subject-matter Units:

#5007	"Growing Plants Indoors"
#5019	"Care of Flowering Plants in the home
#5020	"Reblooming Flowering Gift Plants"
#5023	"Soils for Plant Growth - Amendments for Container Soils"
#5024	"Soils for Plant Growth - Standardized Growing Media"

   b. Slidefilms:

#610	"Foliage Plant Identification" (49FR)
#611	"Foliage Plant Identification" (49FR)
#612	"Foliage Plant Identification" (55FR)
#613	"Planting and Care of Hanging Baskets" (66FR)
#614-1	"Care of Flowering Plants" (61FR)
#614-2	"Care of Gift Plants in the Home" (82FR)
#647	"Planting a Terrarium and How to Keep It" (55FR)

2. University of Illinois, College of Agriculture Cooperative Extension Service.

   Horticulture Facts Sheets:

FL-1-79	Indoor Gardening
FL-4-79	Container Soils are Different
FL-5-79	Physical Properties of a Good Container Soil Amendment

3. Exotic House Plants, A. B. Graf, Roehrs Company, East Rutherforn, N.J. 07073

4. Information Sheets included in this Problem Area:

   a. "Foliage Plant Care Code"
   b. "Common Plant Problems"

5. Sample Test Questions and Teacher's Key

INFORMATION SHEET

FOLIAGE PLANT CARE CODE*

The plant care codes used in this packet are intended to be only a general guide. Plants can be quite flexible in their environmental demands and have shown remarkable tolerance to adverse conditions. The codes do, however, aid beginning indoor gardeners in becoming aware of special requirements various indoor plants possess.

Next to each suggested foliage plant to be learned is a set of four letters. The letters correspond to four general environmental or growing conditions, including temperature, light, soil and watering. Reference to these growing requirements can be made when learning how to care for the various plants.

ENVIRONMENT

All the foliage plants suggested can be used for home and interior decoration as they will tolerate the reduced light of a room and the artifically dry atmosphere.

TEMPERATURE

C Cool or cold: 40-45°F (5-7°C) at night, rising to about 55°F to 60°F (13°-15°C) on a sunny day, with air; 50°F (10°C) in cloudy weather.

I Intermediate, or temperate: 50-55°F (10-13°C) at night, rising to 70° (21°C) on a sunny day, or somewhat higher, with air; 60°F (15°C) if cloudy, before opening ventilators.

S Warm, or 'Stove-house': 62-65°F (16-18°C) at night; can rise to 80 or 85°F (27-30°C) in daytime before ventilators in a greenhouse must be opened. Plants that take a rest or dormancy period, should be kept a few degrees cooler during this time until active growth is to begin again.

LIGHT

B Bright light or full sun. Preference for growth: 4000-8000 foot candles, for average day length. Tolerance, for maintenance: 500-2000 foot candles, based on 16 hour illumination. Intense light is important to most blooming plants, shrubs and trees, also flowering bulbs. Many plants which require sunlight for normal growth can be kept in good condition in the home at much lower light intensity, with artificial light, when maintenance only is desired.

F Filtered or diffused sunlight. Preference: 1000-3000 foot candles for average day length. Tolerance: 100-1000 foot candles, based on 16 hour illumination. A simple indicator of difused sunlight is to pass your hand over your plants and barely see its shadow. A place near a clear east window during summer is best, but a southern exposure must be lightly shaded from direct sun by slatted Venetian blinds, a

bamboo screen, or curtain. For mere maintenance of most plants in this group in good condition in the home, light intensity may go as low as 25 foot candles, though 100 would be better.

N No (direct) sun, shady, or away from sun. Preference: 50-500 foot candles for normal day length. There are very few plants which do not want some sunlight by preference; shade lovers are limited mostly to delicate plants from the forest floor, and ferns. Under artificial illumination, light intensity may be as low as 10 foot candles, but the higher intensity light would be preferable to these plants, provided they are shielded from the sun. High humidity is important to the well-being of plants in this group.

While it is the purpose of this guide to give light requirements for the mere maintenance of plants, it should be mentioned that to make a plant produce sugars and enable it to grow in size, a minimum of 100-200 foot-candles of light, for normal daylength, will be needed; to make plants come into flower, more intense light, 1000 to 2000 ft. - candles would have to be provided at least. Powerful incandescent spotlights are very potent though high in red and infarared only; plants have a preference for a combination of blue (4500 angstrom) with red (6600 angstrom) in proper balance and special fluorescent tubes that recognize this need have been designed and which give results several times highen the 'white' lamps, made for reading, which favor the yellow and green bonds of the spectrum. To properly measure the energy of a light source significant to plant life, readings should now be made in watts per 100 angstrom bond, but the old foot-candle method is relatively simple.

During tests made in our office and the living room, to determine various actual light conditions, measured in foot-candles, I recorded the following:

Daylight, 1 ft. distant from north window: 220 to 500 ft.-cdle.
Daylight, 3 ft. distant from north window: 100 to 180 ft.-cdle.
Incandescent bulb, 75 watt, 1 ft. distant: 150 ft.-cdle.
Incandescent flood light, 75 watt, 3 ft. distant: 40 ft.-cdle.
Incandescent bulb, 100 watt, 3 ft. distant: 40ft.-cdle.
Incandescent bulb, 150 watt, 3 ft. distant: 60 ft.-cdle.
Incandescent flood, 150 watt, 3 ft. distant: 90 ft.-cdle.
Incandescent spot, 300 watt, 3 ft. distant: 180 ft.-cdle.
Fluorescent tube, 40 watt, 1 ft. distant: 120 ft.-cdle.
Fluorescent tube, 40 watt, 2 ft. distant: 75 ft.-cdle.
Four fluorescent tubes, 160 watt, 6 ft. distant: 40 ft.-cdle.
Two 40 w. tubes 3 ft. 60-80, 4 ft. 40-50, 5 ft. 30 ft.-cdle.

(One foot-candle is the amount of light from a candle, received on a surface one foot distant). For more complete readings on light under different conditions see Part 1 under "Living with Plants: Light".

SOIL

L Loam, clay, or good garden soil, usually with decayed manure and up to 1/3 part peat or humus added. Where quick runoff is desirable, include coarse builders' sand; in xerophytic plants like the desert type cacti, sand may be 1/3 to 1/2 of the loam mixture. Add agricultural lime to aggregate the clay particles in soil for good drainage and aeration, as well as to sweeten it. The pasteurization of potting soils is desirable to eliminate harmful bacteria, either by steaming for 1/2 hour at 180°F, or baking moist soil in an oven at 180-250° for 3/4 to 1 hour.

H Soil rich in humus or other organic matter such as leafmold is desirable. Peatmoss is excellent for the root system but needs the addition of fertilizer to become fruitful. A little rough manure should be included, and a small amount of loam for structure. Broken brick or charcoal, granite chips, perlite or coarse sand will improve drainage. Recently, sphagnum moss as well as shredded firbark has been used with great success on such plants as Alocasia, Anthurium, and other aroids, even Christmas cactus, but additional feeding will be necessary. A good combination also is sphagnum peat 1 part to Perlite or Spongerock 1 part by volume, plus added fertilizer, or by follow-up feeding with complete fertilizer formula 1-2-1. 1 part by volume, plus added fertilizer, or by follow-up feeding with complete fertilizer formula 1-2-1. Perlite is a volcanic mineral exploded by heat into light-weight pebbles filled with air bubbles which can attract, and hold moisture uniformly, thereby furthering a healthy root system.

O Osmunda fern fiber, often with some sphagnum moss added, and lumps of charcoal and broken pots for drainage, especially in the bottom of the pots. Lately, the use of shredded firbark (Abies concolor), with about 1/3 peatmoss added, has given spectacular results, inducing prolific roots on many orchids, anthuriums, ferns, etc. However, this material is deficient in nitrogen and should have liquit fertilizer with every second or third watering, and must always be kept damp as it is difficult to uniformly moisten it again if it is allowed to dry out.

WATERING

D Drench thoroughly then allow to become moderately dry between waterings. This admits air into the soil structure which, in turn, promotes development of a healthy white root system; wiry thick roots being characteristic in this group. Watering means soaking the root-ball penetratingly, holding the pot if necessary in a bucket, sink or tub of tepid water until air bubbles cease to rise. During the cold season, with steam heat in the living room, more frequent watering every day or two is required for most plants than from spring to fall. 'Feel' the soil to determine its need for water. Desert type cacti and similar succulents will stand dryness for longer periods.

M Evenly moist but not constantly wet. Plants so classified generally have delicate, hair-like, fibrous roots, subject to rot if kept too wet, and equally easily burning and shrivelling if too dry, especially in hot weather. Standing in a saucer, such plants may be supplied water from the base to a degree where capillary action distributes and maintains uniform moisture throughout the root-ball, without letting the soil become water-soaked and 'sour'. During resting periods and dropping temperatures the soil-ball can be kept more on the dry side.

W Thoroughly wet, or quite moist: never allow such plants to dry out. It is good practice to keep them in a saucer of gravel saturated with water, or in a jardiniere, though drainage water should be emptied every few days to keep from becoming stagnant. Such subjects may revel in moisture but resent having 'wet feet', that is having their roots left standing continuously in water. Exceptions, of course, are bag plants, and aquatics when not resting.

SUGGESTED FOLIAGE PLANTS AND CARE CODES

Aglaonema modestum Chinese Evergreen	INLD
Aphelandra squarrosa Zebra Plant	SFHM
Araucaria excelsa Northfolk Island Pine	IHFM
Asparagus sprengeri Asparagus Fern	IFLD
Brassaia actinophylla Schefflera	SFLD
Chamaedorea elegans Parlor Palm	SFLM
Chlorophytum comosum Spider Plant	IFLM
Cissus rhombifolia Grape Ivy	SFLM
Codiaeum variegatum pictum Croton	SBLM
Crassula argentea Jade Plant	IBLD
Dieffenbachia sp. Dumbcane	SFLD

SUGGESTED FOLIAGE PLANTS (CON'T)

Dizygotheca elegantissima False Aralia	SFLM
Dracaena dermensis "Warneckei' Warneckei Dracaena	SFLM
Dracaena godseffiana Spotted-lead Dracaena	SFLM
Dracaena sanderiana Sander's Dracaena	SFLM
Fatshedera lizei Tree Ivy	IFLM
Fatsia japonica Japanese Fatsia	CFLM
Ficus elastica Rubber Plant	SFLD
Ficus lyrata Fiddleleaf fig	SFLD
Hedera helix English Ivy	CFLM
Helxine soleirolii Baby's Tears	IFHM
Hypoestes sanguinolenta Polka-Dot Plant	SFHM
Maranta leuconeura kerchoveana Prayer Plant	SFLM
Monstera deliciosa Swiss Cheese Plant	SFLM
Nephrolepis exaltata bostoniensis Boston Fern	SFLM
Peperomia caperata Emerald Ripple Peperomia	SFLD
Peperomia sandersii Watermelon Peperomia	SFLD

SUGGESTED FOLIAGE PLANTS (CON'T)

Peperomia obtusifolia Peperomia	SFLD
Philodendron oxycardium Heartleaf Philodendron	SFLM
Pilea cadierei Aluminum Plant	SFLM
Pilea involucrata Pan-American Friendship Plant	SFHM
Pilea microphylla Artillery Plant	SFLD
Plectranthus australis Swedish Ivy	SFLD
Sanservieria trifasciata Mother-in-Laws Tongue	SFLD
Saxifraga sarmentosa Strawberry Begonia	IBLD
Scindapsus aureus Devil's Ivy	SFHD
Syngonium podophyllum Nephthytis	SFLM

This 'Key to Care' can at best be a general guide. Surprisingly, many plants will gradually adapt themselves to varying conditions. Tropical or subtropical climate is by no means a perfect state of affairs -- there are many chilly, wet nights, and dry, exhausting days. Various plant families and their different species in themselves are the products of ages of adjustment to their habitats. There is no problem for a tropical plant to grow in Santos or in Singaopor, but to do so under our north-temperate indoor conditions each must pass a severe test.

*Adapted from Exotic House Plants, A. B. Graf, Roehrs Company, East Rutherford, N.J. 07073.

INFORMATION SHEET

COMMON PLANT PROBLEMS

SYMPTOM	CAUSE	CURE
Cottony white fuzz on leaves	Mealybug	Treat plant with insecticide labeled for use against mealybug.
Brown scales on stems and leaves	Scale insects	Every three to four days, rub leaves with rubbing alcohol.
Webs in the crotches of leaves and webs on the undersides of leaves	Red spider mite	Wash plant with a mild solution of dish soap and water. (Don't do this with hairy leaves). Treat with miticide registered for use against Red Spider mites.
Small white flies	Whitefly	Every three to four days, rub leaves with rubbing alcohol. Treat the plant with an insecticide labeled for use against whitefly.
Green growth on soil's surface	Algae and moss	Carefully remove soil on the surface and replace with new soil.
Pale new leaves that quickly turn brown.	Lack of humidity	Raise humidity in room, if possible.
Yellowing leaves (bottom ones)	Lack of nitrogen	Fertilize and water the plant regularly.
Soft stems*	Too much water or plant set too deep in soil.	Let plant dry out, then determine how much water to give it.
Dropping old, young leaves*	Old: sudden decrease in light. Young: soil too heavy.	Old: Place in sunny area. Young: Transplant with mixture of potting soil and vermiculite or peat.
Curling leaves	No drainage hole in pot: too much water in root zone.	Transplant to pot with drainage hole. Water when necessary.

Information Sheet (con't)

SYMPTOM	CAUSE	CURE
Black, misshapen leaves	Soil too salty	Flush salts out of soil.
Small, lackluster during new growth	Underfed or pot too small	Fertilze plant on a regular basis, or transplant to a larger pot.
Brown tips on leaves	Flouride injury	Remove damaged areas; keep soil uniformly moist.
Tan spots on leaves	Too much direct sunlight	Reduce direct sunlight.
Black spots on leaves*	Drafts	Move plant from drafts outside doors, heating and cooling units)

*Low light levels may cause these symptoms.

STUDENT WORKSHEET

PLANT CARE

Purpose: To identify and record the cultural requirements of selected house plants.

Objective: Upon completion of this exercise, students will be able to associate various cultural requirements with selected plants.

Procedure: Visit to a local home in which many house plants are maintained. Identify 10 plants seen growing in the home, and in the space below record the plant name and rate its healty by circling poor, fair, good or excellent.

On the chart provided record the cultural requirements for the selected plants. Refer to books, notes, and the information Sheet "Plant Care Codes."

	House Plant Name	Health Rating			
1.	_____	Poor	Fair	Good	Excellent
2.	_____	Poor	Fair	Good	Excellent
3.	_____	Poor	Fair	Good	Excellent
4.	_____	Poor	Fair	Good	Excellent
5.	_____	Poor	Fair	Good	Excellent
6.	_____	Poor	Fair	Good	Excellent
7.	_____	Poor	Fair	Good	Excellent
8.	_____	Poor	Fair	Good	Excellent
9.	_____	Poor	Fair	Good	Excellent
10.	_____	Poor	Fair	Good	Excellent

PLANT CARE

PLANT NAME	LIGHT REQUIREMENT	WATERING PRACTICE	RECOMMENDED SOIL MIX	PROPAGATION	ADDITIONAL NOTES
EXAMPLE: Airplant Plant or Spider Plant	filtered light	keep soil evenly moist	all-purpose soil	root airborne offsets	runners develop under short day conditions

SAMPLE TEST QUESTIONS AND TEACHER'S KEY

IDENTIFYING AND CARING FOR FLOWERING AND FOLIAGE HOUSE PLANTS

Multiple Choice

__C__ 1. Which of the following does not prefer moist soil?

a. Norfolk Island Pine
b. Asparagus Fern
c. Peperomia
d. Spider Plant

__D__ 2. Which plants tolerate poorly lit locations?

a. Snake plant
b. Devil's Ivy
c. Aglaonema
d. All the above

__E__ 3. Which plants can be trees or large shrubs?

a. Norfolk Island Pine
b. Schefflera
c. Croton
d. Both a & c
e. All the above

__D__ 4. Which plants trail or tend to have a viney appearance?

a. English Ivy
b. Grape Ivy
c. Pan-American Friendship Plant
d. a and b

__C__ 5. _____ has long narrow leaves.

a. Rubber plant
b. Fiddleleaf Fig
c. Warneckei Dracaena
d. Artillery Plant

__B__ 6. _____ is the whitish to brown buildup on the edges of pots or on the top of soil.

a. Moss
b. Soluble salts
c. Mold
d. Mealy bugs

__C__ 7. _____ is an example of slow-release fertilizer.

a. Selsun Blue
b. Kelthane
c. Osmocote
d. Malathion

__D__ 8. Plants that suddenly wilt may be

a. lacking water
b. overwatered
c. overfertilized
d. all of the above

__D__ 9. House plants moved outside during the summer usually need more _____ than plants grown indoors.

a. fertilizer
b. water
c. bright light
d. both a & b

__D__ 10. House plants grown in conditions too dark display: _____

a. lack of leaf color
b. wilting
c. pale or spindly growth
d. both a & c

True (+) - False (0)

1. __+__ Plants can be planted in too large of a pot.

2. __0__ Most tropical plants thrive in clay soil.

3. __0__ Peperomias are easy to identify because they all look alike.

4. __+__ Watering practices depend on the light, temperature and humidity a plant receives.

5. __0__ Tropical plants should be fertilized bi-weekly to induce lush growth.

6. __0__ Mealybugs look like dark bumps on leaves or stems.

7. __+__ Many tropical plants can be propagated asexually.

8. __0__ Foliage plants should never be grown outside in the summer.

9. __+__ Most foliage plants require temperatures above 55 degrees.

10. __+__ Tall pots tend to have better drainage than short, shallow pots.